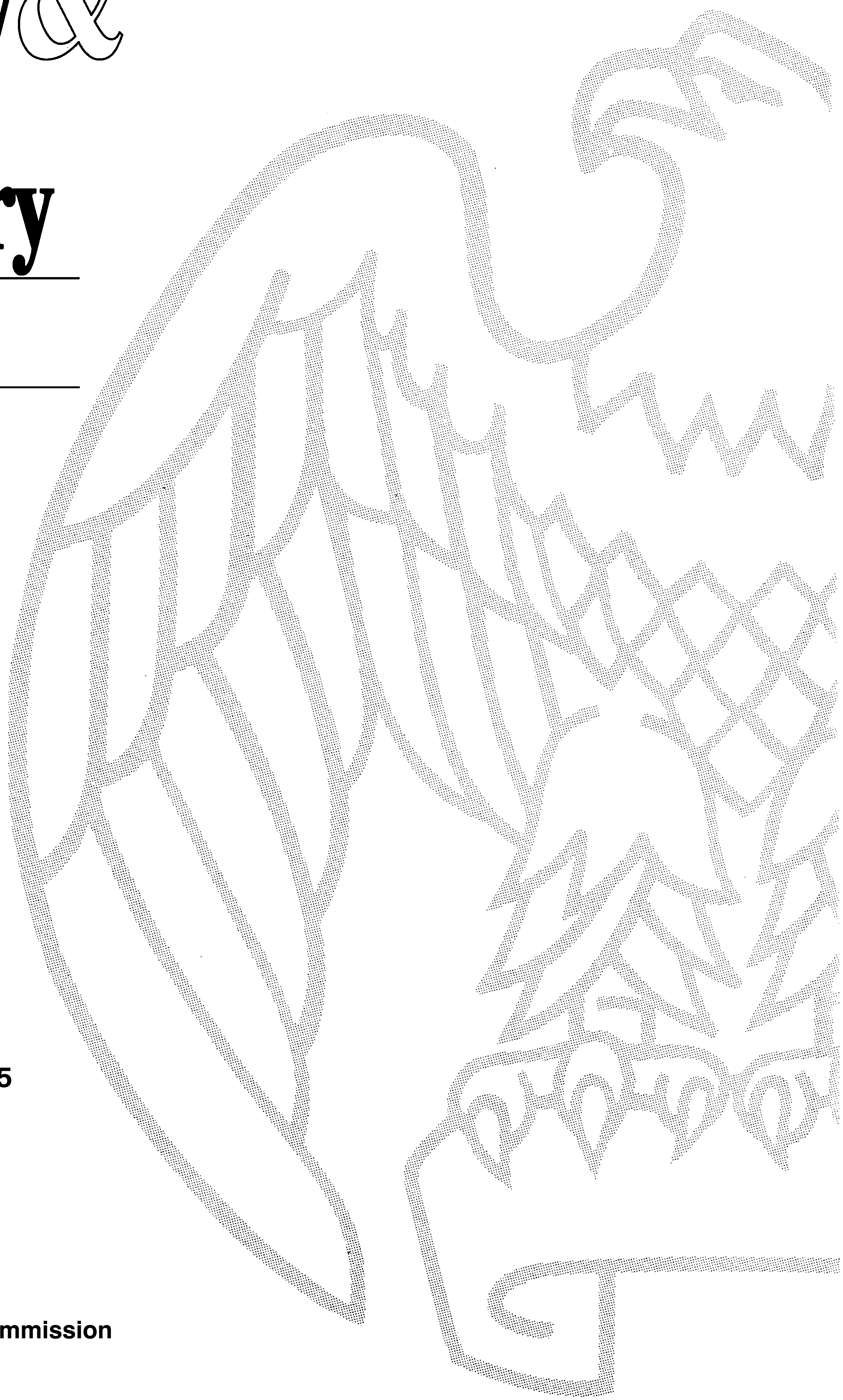
Industry & Trade Summary

Motor Vehicles



USITC Publication 3545
September 2002

OFFICE OF INDUSTRIES
U.S. International Trade Commission
Washington, DC 20436

UNITED STATES INTERNATIONAL TRADE COMMISSION

COMMISSIONERS

This report was prepared principally by

Laura Polly

Transportation Branch
Electronics and Transportation Division

Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

ITC READER SATISFACTION SURVEY

Industry and Trade Summary: Motor Vehicles

The U.S. International Trade Commission (ITC) is interested in your voluntary comments (burden < 15 minutes) to help us assess the value and quality of our reports, and to assist us in improving future products. Please return survey by fax (202-205-2018) or by mail to the ITC.

Your name and title (please print; r*esponses below not for attribution):*____________________

Please specify information in this report most useful to you/your organization: ________________

____

Was any information missing that you consider important? _____Yes (specify below) _____ No

If yes, please identify missing information and why it would be important or helpful to you:_______

____

Please assess the ***value*** of this ITC report (answer below by circling all that apply): **SA**—Strongly Agree; **A**—Agree; **N**—No Opinion/Not Applicable; **D**—Disagree; **SD**—Strongly Disagree

▶ Report presents new facts, information, and/or data	SA	A	N	D	SD
▶ Staff analysis adds value to facts, information, and/or data	SA	A	N	D	SD
▶ Analysis is unique or ground breaking	SA	A	N	D	SD
▶ Statistical data are useful to me/my organization	SA	A	N	D	SD
▶ Subject matter and analysis are timely	SA	A	N	D	SD
▶ ITC is the only or the preferred source of this information	SA	A	N	D	SD

If not, please identify from what other source the information is available ________________

Please evaluate the ***quality*** of this report (answer below by circling all that apply): **SA**—Strongly Agree; **A**—Agree; **N**—No Opinion/Not Applicable; **D**—Disagree; **SD**—Strongly Disagree

▶ Written in clear and understandable manner	SA	A	N	D	SD
▶ Report findings or executive summary address key issues	SA	A	N	D	SD
▶ Figures, charts, graphs are helpful to understanding issue	SA	A	N	D	SD
▶ Analysis throughout report answers key questions	SA	A	N	D	SD
▶ Report references variety of primary and secondary sources	SA	A	N	D	SD
▶ Sources are fully documented in text or footnotes	SA	A	N	D	SD

Please provide further comment on any of the above performance measures, as appropriate:

Suggestions for improving this report and/or future reports: __________________________

____

Other topics/issues of interest or concern: ____________________________________

Please provide your Internet address and update your mailing address below, if applicable:

FOLD

UNITED STATES
INTERNATIONAL TRADE COMMISSION
WASHINGTON, DC 20436

OFFICIAL BUSINESS
PENALTY FOR PRIVATE, USE $300

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 12840 WASHINGTON, DC

POSTAGE WILL BE PAID BY ADDRESSEE

U.S INTERNATIONAL TRADE COMMISSION
500 E STREET, SW.
WASHINGTON, DC 20277-2840

ATTN:
OFFICE OF INDUSTRIES
ITS: Motor Vehicles

PREFACE

In 1991 the United States International Trade Commission initiated its current *Industry and Trade Summary* series of informational reports on the thousands of products imported into and exported from the United States. Each summary addresses a different commodity/industry area and contains information on product uses, U.S. and foreign producers, and customs treatment. Also included is an analysis of the basic factors affecting trends in consumption, production, and trade of the commodity, as well as those bearing on the competitiveness of U.S. industries in domestic and foreign markets.[1] This report on motor vehicles covers the period 1997-2001.

[1] The information and analysis provided in this report are for the purposes of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under statutory authority covering the same or similar subject matter.

CONTENTS

CONTENTS–*Continued*

CONTENTS–*Continued*

CONTENTS–*Continued*

Page

Tables–*Continued*

ABSTRACT

This report addresses trade and industry conditions for motor vehicles for the period 1997-2001.

- U.S. motor vehicle production decreased from 12.1 million units in 1997 to 11.4 million units in 2001. Production by the Big Three (General Motors, Ford, and the Chrysler division of DaimlerChrysler) registered an average annual percentage decrease of 2.4 percent, while total U.S. production registered an average annual percentage decrease of 1.3 percent. During the period, the Big Three share of U.S. production decreased from 80 percent in 1997 to 76 percent in 2001. Japanese and German transplants picked up the slack, accounting for 22 percent and 2 percent, respectively, of U.S. production in 2001, up from 20 percent and less than 1 percent in 1997.

- Because the U.S. market is the largest in the world, and is generally considered to be among the markets most open to imports, import consumption is high. During 1997-2001, sales of imports as a percentage of total motor vehicle sales increased each year, from 13 percent of retail sales in 1997 to 18 percent in 2001. Although subsidiaries of U.S. automakers, primarily in Canada, are a major source of U.S. imports of passenger vehicles, imports from Japan exert the greatest competitive pressure on U.S. automakers. U.S. imports from Japan accounted for approximately 10 percent of U.S. passenger car sales in 2001, and 9 percent of U.S. light truck sales. However, Japanese automakers rely heavily on their U.S. assembly plants to serve the U.S. market. Japanese nameplate vehicles, regardless of place of assembly, accounted for 27 percent of U.S. passenger vehicle sales in 2001. Other leading sources of motor vehicle imports include Mexico, Germany, and Korea.

- Sales of passenger vehicles to individual consumers and businesses account for most sales and are roughly equal. Sales to Federal, State, and local governments account for a very small percentage of total U.S. car sales. Trends in motor vehicle sales in the United States are dominated by cyclical macroeconomic trends in the U.S. economy. Typically, sales downturns of several years follow several years of sales growth. Passenger vehicle sales are highly representative of the health of the U.S. economy and are considered to be an important leading economic indicator. New passenger vehicle sales are influenced by personal income growth, unemployment levels, consumer confidence, and the value of used cars. Factors considered by purchasers of commercial vehicles include how the vehicle would meet their transport needs, the price of the vehicle, and the lifecycle cost of the vehicle. Commercial vehicles must meet a very high

ABSTRACT–*Continued*

quality and reliability standard so that costly downtime is minimized and maintenance costs are as low as possible.

- The U.S. automotive industry spends over $18 billion annually in research and development of new advanced technologies aimed largely at four areas: emissions, fuel efficiency, safety, and performance. The automotive industry claims that it devotes more funds to research and development than any other manufacturing industry. Although competition is fierce, automakers recognize the benefits of working together on key areas of precompetitive research. The Big Three have formally collaborated on a number of shared technological and environmental concerns through the United States Council for Automotive Research (USCAR), formed by the three companies in 1992.

INTRODUCTION

This summary covers developments in the motor vehicle industry, which includes passenger vehicles, commercial trucks, buses, and bodies and chassis of these vehicles, during 1997-2001. Information from earlier years, as well as forward-looking trends, are presented where appropriate. Because passenger vehicles – cars and light trucks (pickup trucks, sport-utility vehicles (SUVs), vans, and minivans) – account for over 97 percent of U.S. production and motor vehicle sales, they will be given appropriate emphasis throughout. The report will begin with a comprehensive profile of the U.S. industry, which consists of traditional U.S. companies, Japanese and European 'transplants,'[1] and U.S.-foreign joint-venture operations. It will then present facts and trends related to the U.S. market and discuss U.S. trade and related issues. The summary also provides a profile of leading foreign industries.

Automobile production is among the largest manufacturing industries in the United States, and as such it is a critical economic driver, contributing substantially to employment and productivity. Motor vehicle production reportedly accounts for over 5 percent of the U.S. private-sector gross domestic product, and one out of every seven jobs in the United States is in automotive manufacturing or a related industry. Automakers are important customers of other businesses; for example, automakers are the largest consumer of steel in the United States.[2]

The United States is the world's largest single-country producer[3] and consumer of motor vehicles. In 2001, passenger car and commercial vehicle production reached 11.4 million units, and sales reached 17.5 million units.[4] Despite the fact that it is a mature market, the United States remains the most important country in the world for investment by, and competition among, global motor vehicle producers. Owing to these influences, the U.S. motor vehicle industry has been characterized by constant organizational and technological change, an increasing global presence, extensive international alliances, greater cooperation among domestic rivals, and improved responsiveness to consumers. The industry has made such changes in the presence of new regulatory demands, extreme cycles in the U.S. market, and strong competition from foreign automakers.

The various segments of the motor vehicle industry have many common as well as distinctive features related to the basic characteristics of the products, production methods, and competitive and structural trends. The three major categories included in this report are described below.

---

[1] "Transplant" is a term that refers to U.S. assembly operations of foreign automakers.

[2] The Alliance of Automobile Manufacturers, found at Internet address *http://www.autoalliance.org/facts.htm*, retrieved Oct. 23, 2001.

[3] As a region, the EU produces more vehicles per annum than the United States.

[4] *Ward's Automotive Reports*, vol. 77, No. 5, Feb. 4, 2002, p. 8; and *Ward's Automotive Reports*, vol. 77, No. 3, Jan. 21, 2002, p. 2.

Passenger Vehicles

The passenger vehicle industry includes passenger automobiles and light trucks, which are often considered as two related market segments. Passenger automobiles, or cars, include sedans, station wagons, convertibles, and sports cars. Light trucks include pickup trucks, SUVs, vans, and minivans, most of which have a gross vehicle weight (gvw) of no more than 10,000 pounds, although some industry data sources include trucks up to 14,000 pounds gvw in the light truck category. Although cars and light trucks are distinctly different vehicles, unlike the other motor vehicles included in this report, they are produced primarily for individuals who purchase them for private transportation. Moreover, these vehicles generally have common production processes, distribution systems, and producers.

Medium- and Heavy-Duty Trucks

Medium- and heavy-duty trucks account for nearly 3 percent of U.S. production and sales of motor vehicles. These trucks are used primarily for carrying goods; classes 4-7, which are medium-duty trucks, typically have a gvw of between 10,001 and 33,000 pounds, and class 8 heavy-duty trucks are those over 33,000 pounds gvw. This vehicle group includes tractor units that pull semi-trailers, as well as integrated units. Medium- and heavy-duty trucks are sold mainly for commercial use. Many of these trucks are produced by the same companies that produce passenger vehicles.

Buses

Buses account for less than 1 percent of the motor vehicle industry. They are primarily designed for the public transportation of 12 or more passengers, and can be divided into three categories: motor coaches for intracity transportation, urban transit buses for intercity transportation, and school buses and other specialty buses. In general, bus manufacturers do not produce trucks and passenger vehicles; however, bus producers make extensive use of chassis, engines, and transmissions produced by truck manufacturers.

Bodies and Chassis

Bodies and chassis are major components of motor vehicles, forming a type of foundation to which other parts are attached to form a vehicle. In fact, a vehicle chassis is sometimes considered to be an unfinished vehicle. In most cases, motor vehicle manufacturers produce the chassis and bodies of the vehicles, although, as noted, bus producers often purchase chassis from a supplier, and then add various other components to form a completed vehicle.

Assembly Process

Motor vehicles are assembled in factories, generally referred to as assembly plants,[5] where thousands of parts and subassemblies come together on a production line. The motor vehicle production process, while very complex, can be divided into four major steps. First, the major components of the body and chassis are stamped from steel or formed with other materials such as aluminum, fiberglass, or composite plastic.[6] The body and chassis parts are then attached by welding, or sometimes with adhesives, to form the basic foundation of the vehicle. The body is then painted. Finally, the body/chassis assembly is placed on an assembly line where other components are attached to the vehicle. Certain portions of the production process are highly automated, requiring little or no direct human labor input. The primary material input for motor vehicle production is steel, although various types of metal, plastics, rubber, glass, and textiles are also used extensively.

U.S. INDUSTRY PROFILE[7]

Producers

The U.S. motor vehicle manufacturing industry is highly concentrated. U.S. passenger vehicle production accounts for more than 97 percent of total motor vehicle production, with foreign-based automakers accounting for a growing share of U.S. production. In 2001, traditional U.S. manufacturers known as the Big Three – General Motors (GM), Ford, and Chrysler (as of 1998 a subsidiary of DaimlerChrysler of Germany) – accounted for approximately 76 percent of U.S. passenger vehicle production. Japanese automakers Honda, Mitsubishi, Nissan, Subaru-Isuzu, and Toyota accounted for 18 percent, and European automakers BMW and Mercedes-Benz (division of DaimlerChrysler) accounted for nearly 2 percent. There are two U.S.-Japanese joint ventures – Autoalliance International (Ford-Mazda) and New United Motor Manufacturing, Inc. (NUMMI) (GM Toyota) – which accounted for nearly 4 percent.[8] Within the passenger vehicle segment, there has been a steady increase in the production of light trucks to meet market demand. In 1997, light trucks accounted for 50 percent of passenger vehicle production; by 2001 their share of passenger

---

[5] Differing from some industries, the motor vehicle industry term "assembly plant" does not imply a facility capable of only relatively simple production processes. Motor vehicle assembly plants may engage in anything from relatively limited to very extensive production processes.

[6] Some assembly plants produce certain vehicle parts such as the body stampings, while other plants only assemble the vehicle; consequently, caution should be used when comparing plant productivity on a vehicles-produced-per-employee basis. Body stamping, for example, is a major operation that, when performed in the final assembly plant, requires the addition of a significant number of employees.

[7] The products covered in this report are classified in the North American Industry Classification System under headings 33611, Automobile and Light Duty Motor Vehicle Manufacturing; and 33612, Heavy Duty Truck Manufacturing (except for 336212, Truck Trailer Manufacturing and 336214, Travel Trailer and Camper Manufacturing).

[8] *Ward's Automotive Reports*, vol. 77, No. 5, Feb. 4, 2002, p. 8.

vehicle production reached 56 percent.[9] This figure is up from just 33 percent as recently as 1990.[10]

Japanese automakers began producing in the United States in the 1980s largely as a means to avoid the constraints of a voluntary restraint agreement on Japanese exports of passenger vehicles to the United States. These assembly operations are known as 'transplants.' Localized production allows Japanese automakers to remain responsive to U.S. market developments, alleviate potential trade friction, and dramatically reduce transportation costs. German automakers BMW and Mercedes-Benz adopted this strategy in the 1990s, with production beginning in their newly established plants in South Carolina in 1994 and Alabama in 1997, respectively. The Korean industry will be the next to establish assembly operations in the United States, with Hyundai announcing in April 2002 that it would begin production in Alabama in 2005.[11]

The production of medium- and heavy-duty trucks and buses accounts for the remaining 3 percent of total U.S. motor vehicle production. U.S. producers of trucks include Ford, Freightliner, GM, Isuzu, Mack, Navistar, Paccar (Kenworth and Peterbilt brands), Volvo, and Western Star. Domestic bus manufacturers include Blue Bird, Chance Coach, El Dorado National, Federal Coach, Gillig, Goshen Coach, Motor Coach Industries, Mid Bus, North American Bus Industries, Navistar, Neoplan, New Flyer, Nova BUS, Setra, Thomas Built Buses, and World Trans.

Employment

Based on average hourly pay, automotive employees earn more than employees in virtually every other industry in the United States.[12] Employment in the U.S. motor vehicle industry[13] was fairly steady during 1997-2000, but dropped by 6 percent in 2001 (table 1). Production workers as a percentage of total employment decreased each year, from 77 percent in 1997 to 70 percent in 2001. Total employment levels over the 10-year period 1992-2001 fluctuated upward by 8 percent; employment in 1992 totaled 348,800.

---

[9] *Ward's Automotive Reports*, vol. 77, No. 5, Feb. 4, 2002, p. 8; and *Ward's Automotive Reports*, vol. 73, No. 6, Feb. 9, 1998, p. 6.

[10] *Ward's Automotive Reports*, vol. 67, No. 3, Jan. 20, 1992, p. 1.

[11] Lindsay Chappell, "Alabama plant presents Hyundai with a challenge," *Automotive News*, Apr. 8, 2002, p. 3.

[12] The Alliance of Automobile Manufacturers, found at Internet address *http://www.autoalliance.org/facts.htm*, retrieved Oct. 23, 2001.

[13] Defined as SIC numbers 3711, motor vehicles and car bodies, and 3713, truck and bus bodies.

Table 1
U.S. motor vehicle industry employment and wages, 1997-2001

Year	All employees (thousands)	Production workers (thousands)	Wages[1] (dollars)
1997	388.6	300.6	21.63
1998	388.3	285.0	21.80
1999	400.6	287.8	21.73
2000	398.7	283.2	22.91
2001	376.1	261.6	24.03

[1] Average hourly earnings of production workers.
Source: Bureau of Labor Statistics.

The average hourly earnings of production workers[14] remained fairly steady during 1997-2001, with an average annual percentage change of less than 3 percent. However, the average hourly earnings of production workers in 2001 were 31 percent greater than those of workers in 1992.[15] Motor vehicle industry employees in the United States are the second-highest paid in the world, with Germany ranking first and Japan, third.[16]

It is considered likely that the U.S. industry will undergo decreases in employment in the coming years. According to some, U.S. manufacturers lag the Japanese transplants in efficiency because they are overstaffed by tens of thousands of workers.[17] One industry analyst estimates that global overcapacity calls for the closure of 40 auto plants, up to 12 of them in North America.[18] Industry sources indicate that producers have become reluctant to add workers even when sales are strong, preferring to utilize overtime or various types of multiple-shift production.

A large portion of the U.S. motor vehicle industry is unionized under the International Union, United Automobile, Aerospace and Agricultural Implement Workers of America (UAW), making reductions in force difficult to implement. Despite the fact that the 1999 contract between the UAW and the Big Three specified a moratorium on plant closings until 2003, the UAW claimed to have lost more than 90,000 members in 2000. The elimination of motor vehicle and component assembly jobs is reportedly responsible for a significant

[14] For SIC 3711 only.
[15] Bureau of Labor Statistics, found at Internet address *http://data.bls.gov*, retrieved Apr. 3, 2002.
[16] *Ward's Automotive Yearbook 2001* (Southfield, MI: Ward's Communications, 2001), p. 293.
[17] PricewaterhouseCoopers, "Contract '99: Membership or Money?" Sept. 8, 1999, found at Internet address *http://www.just-auto.com*, retrieved Apr. 19, 2002.
[18] Reuters, "Automakers face possible battle with UAW," Sept. 27, 2001, found at Internet address *http://www.just-auto.com*, retrieved Sept. 27, 2001.

portion of this membership reduction.[19] To date, the UAW has been largely unsuccessful in organizing the Japanese- and European-based auto plants in the United States, with a number of defeats during 1997-2001. In 1997, the UAW lost a second try at unionizing Nissan's plant in Smyrna, TN; in 1999 the teamsters failed to organize Honda workers at Marysville, OH; in 2000 the UAW failed to organize Mercedes-Benz workers in Tuscaloosa, AL, and Toyota workers in Georgetown, KY; and in 2001, a third attempt to organize Nissan Smyrna ended in failure. The union has been successful in organizing AutoAlliance (Ford-Mazda joint venture), Mitsubishi Motor Manufacturing of America, and NUMMI (GM-Toyota joint venture).[20]

Geographic Distribution

U.S. motor vehicle and related production is concentrated in the Midwestern United States and is centered in Michigan. This region of headquarters offices, R&D centers, vehicle and parts production, and tool suppliers provides locational advantages for motor vehicle producers. In recent years, however, the industry has expanded considerably in the southeastern part of the country; this growth is led by foreign-based automakers.[21] In 2000, Michigan accounted for one-third of all car production in the United States, followed by Ohio (18 percent), Illinois (13 percent), Kentucky (7 percent), and Tennessee (6 percent). Michigan also was the leading State for U.S. light-, medium-, and heavy-duty truck production, accounting for 18 percent of such production. Other leading truck-producing States include Missouri (15 percent), Ohio (12 percent), Kentucky (12 percent), and Indiana (7 percent).[22]

Labor Intensity

Skill requirements in the motor vehicle industry are diverse; some production jobs demand relatively little skill and have a short training period, while others require extensive training periods. The motor vehicle industry continues to use an extensive amount of labor, despite efforts to increase automation of certain segments of the production process. Robots are used widely for tasks such as welding, painting, and materials handling, and automation of physically demanding or more dangerous tasks is also increasing. It is widely known within the industry that the most efficient plants in the world rely not on extensive automation, but on highly efficient organization of the production process. Thus, motor vehicle producers

[19] Just-auto.com editorial team, "UAW loses 90,000 members," Apr. 26, 2001, found at Internet address *http://www.just-auto.com*, retrieved Apr. 26, 2001.

[20] Lindsay Chappell, "UAW takes new tack to unionize Nissan plant," *Automotive News*, Aug. 28, 2000, p. 6; and Reuters, "Nissan workers in Tennessee reject UAW," Oct. 4, 2001, found at Internet address *http://www.just-auto.com*, retrieved Oct. 4, 2001.

[21] Foreign automakers have been attracted to the Southeastern United States for a number of reasons, including public incentives offered by States; typically lower-cost, non-unionized labor; and comparatively lower tax rates. Brian Corbett, "Southern Hospitality: The auto industry is migrating south," *Ward's Auto World*, Aug. 2002, p. 45.

[22] *Ward's Automotive Yearbook 2001*, pp. 236 and 242.

integrate automation technology into the production process insofar as it improves the overall efficiency of the system.[23]

Manufacturing Trends

Lean Manufacturing

Japanese automaker Toyota created the lean manufacturing system that not only permeates the global auto industry, but has been adopted by countless manufacturing plants across various industries around the world. A producer using lean manufacturing methods makes continual efforts to improve the quality of the product and refine the production process to improve efficiency. Lean production demands the elimination of waste by uncovering inefficiencies and bottlenecks in the production system, requiring fewer resources than are typically used in more traditional types of mass production, and demanding nearly perfect quality of the components used in the vehicle. Workers have greater autonomy and responsibility in order to ensure that defects are fixed on the assembly line rather than at the end of the assembly process. Under a lean production system, assembly plants are often close to suppliers to facilitate communication, timely parts shipments, and low inventories. The system requires fewer managers and levels of management, fewer production workers, and broader worker responsibilities, all of which combine to allow greater flexibility within all levels of the company and create higher quality products.[24]

Just-in-Time

Integral to a lean manufacturing system is just-in-time parts delivery. Traditionally in the just-in-time system, suppliers are responsible for delivering only the parts that are needed, when they are needed, to the assembly line. This all but eliminates the need for automakers to store large inventories of parts, allowing for significant cost savings.[25] However, a rival system, known as the 'milk-run system,' is gaining in popularity. Although both systems are largely based on electronic communications, the milk-run system reverts the logistical

---

[23] For example, Toyota eschews high-technology software options for managing its parts handling and logistics in favor of its *kanban* system of laminated colored cards that are integral to its just-in-time system. Lindsay Chappell, "To heck with tech," *Automotive News*, Automotive News Insight section, Aug. 6, 2001, p. 36i.

[24] A leading source on the application of lean manufacturing in the automotive industry is James P. Womack, et. al., *The Machine that Changed the World* (New York: Rawson, 1990).

[25] However, the potential pitfalls of just-in-time parts delivery to auto plants were evident in the days after the September 11, 2001, terrorist attacks on the United States. Air freight of parts was suspended for a number of days, and a tightening of security at the Canadian border caused delays in road-transported goods in excess of an entire day. Automakers cancelled shifts because of parts shortages, and an estimated 50,000 units of production were lost in the first week after the attack. Although an extreme case, the events of September 11, 2001, show how disruptions in the transport sector can negatively affect just-in-time operations.

responsibility back to the automakers. Under the milk-run system, automakers continuously run trucks to supplier factories, picking up and delivering needed parts to the assembly line. Automakers report that they like the fact that they no longer pay suppliers for their transportation costs. In addition, coupled with Internet purchasing, milk-run systems reportedly cut on-floor inventories to levels below just-in-time systems. The milk-run system was reportedly brought to Japan from Europe by Nissan in 2000, and it is slowly gaining acceptance there.[26]

Automakers put their own stamp on their parts supply systems. For example, a further expansion of the milk-run system is Toyota's cross-dock transshipment system. Toyota, reportedly using the milk-run system in its U.S. plants for several years, has its trucks pick up parts from suppliers and bring them to one of four cross-dock centers. These centers offload the parts on one side, sort them by the factory for which they are destined, and send them out the other side to be loaded onto trucks heading for the assembly plants. There is no storage at the cross-dock facilities, and Toyota claims that the combination milk-run/cross-dock system is more cost effective than milk run alone,[27] reducing overall mileage traveled, cutting the number of trucks in use by 25 percent, and centralizing logistics.[28]

At Ford's plant in Valencia, Spain, just-in-time has evolved into 'direct automatic delivery,' whereby finished modules manufactured by some 40 suppliers in a supplier park adjacent to the assembly plant are moved directly to the vehicle assembly line via conveyors. Computer sensors monitor parts traveling in metal carriers through the conveyor tunnels. Ford claims that this system is most efficient, saving time and money, and reducing the risk of parts damage.[29]

Nissan is reportedly considering conveyor transport of parts for its new light truck plant in Canton, MS. Important suppliers will be located near the assembly plant, with some setting up shop on site.[30] Nissan reports that, for onsite suppliers, it would lease the real estate to the supplier and the supplier would make the initial investment to construct its factory. If the supplier loses its contract at a later point, the supplier would vacate, and Nissan or the replacement supplier would pay the outgoing supplier the residual value of the factory.[31] Suppliers would produce parts only as Nissan orders them for vehicles ordered by Nissan's retailing operation.

---

[26] Ayako Doi, "European 'Milk Run' System May Displace *Kanban* as New Standard for Lean Manufacturing Logistics," *The Japan Automotive Digest*, vol. VII, No. 30, Aug. 27, 2001, p. 1.

[27] Ayako Doi, "Logistics: Toyota Improves on Milk Run With 'Cross-Dock' Transshipment System," *The Japan Automotive Digest*, vol. VII, No. 39, Oct. 29, 2001, p. 10.

[28] Chappell, "To heck with tech."

[29] Rhoda Miel, "Ford works on 'direct automatic delivery' in Spain, *Automotive News*, Jan. 14, 2002, p. 26J.

[30] Lindsay Chappell, "Nissan plant will be just-in-time showcase," *Automotive News*, Automotive News Insight section, Aug. 6, 2001, p. 12i.

[31] Ibid.

Six Sigma

Six Sigma is another manufacturing technique that is employed in the auto industry, most notably by Ford. Six Sigma is a disciplined, data-based approach and methodology for eliminating defects (defined as anything outside of customer specifications) in any process. The Greek letter s (sigma) refers to the standard deviation of a population; in Six Sigma, a manufacturer aims for six standard deviations between the mean and the nearest specification limit in any process. The statistical representation of Six Sigma describes quantitatively how a process is performing. To achieve Six Sigma, a process must not produce more than 3.4 defects per million opportunities.[32]

Ford reported that its Six Sigma projects saved the company $325 million in 2001 through the elimination of waste. The program examines customer complaints and identifies variations in parts and/or processes that may be at the root of the problem. This information is shared throughout the company so that similar issues in other vehicle programs may be resolved early or avoided entirely.[33]

Flexible Manufacturing

Flexible manufacturing has become a goal for all automakers in recent years, with Honda the undisputed leader in this area. In the fullest sense, flexible manufacturing would allow an automaker to shift production of vehicles among any of its global auto plants, allowing for a measure of control over unfavorable exchange rates, ability to meet unexpected demand for new vehicles, and the smoothing of production levels within the automaker's global operations. Honda's new *Takai* flexible production system was launched in 2000, and identical systems have been installed in most of its major facilities around the world, a first in the global auto industry. The principal features of the system include a simplified conveyor process, state-of-the-art reprogrammable robots, and a reconfigured assembly line that utilizes quality checks in each of five new zones. The system allows a single factory to build all of Honda's 40 models, accommodating 8 different vehicles at one time (up from 5) from as many as 4 distinct platforms.[34] Most flexible U.S. plants can handle vehicles from no more than two distinct platforms. Honda's flexible assembly lines increase production potential by allowing the automaker to switch from producing one vehicle to another in just 3 minutes, down from 7 minutes. Honda reports that the system has cut manufacturing costs by 10 percent, with another 10 percent expected to be cut by 2003. In addition, the company claims that the new flexible system has cut new car investment and assembly line workload by 50 percent,[35] allowing Honda to introduce new models more quickly and at lower cost. Similarly, Chrysler reportedly employs flexible manufacturing at three of its North American

---

[32] Information on Six Sigma found at Internet address *http://www.isixsigma.com*, retrieved May 2, 2002.

[33] Eric Mayne, "Ford Reaps Benefits from Six-Sigma," *Ward's Automotive Reports*, vol. 77, No. 9, Mar. 4, 2002, insert p. 1.

[34] The term 'platform' refers to the primary load-bearing structural assembly that determines the basic size of a motor vehicle, supports the driveline, and links the suspension components of the motor vehicle.

[35] Nicole George, "Honda Puts Flexible Manufacturing To The Test, And Gets Good Results," *The Japan Automotive Digest*, vol. VII, No. 40, Nov. 5, 2001, p. 9.

plants (though not to the extent of Honda); these plants are designed to assemble two products and introduce a third with smooth changeover and no production stoppage.[36]

Build-to-Order

Another recent trend in the global auto industry is the move toward 'build-to-order' (BTO) systems (also known as order-to-delivery, integrated customer ordering, and pull manufacturing). BTO signifies a shift from a production-push model to a demand-pull type of industry. Industry analysts agree that the traditional fixed volume way of manufacturing, whereby automakers base their production levels and mix on highly complex forecasting and scheduling techniques, is outdated and costly. Inaccurate forecasting associated with fixed volume manufacturing often leaves dealers with large inventories of passenger vehicles, forcing automakers to offer generous, and costly, incentives to sell these vehicles. A study conducted in 2001 showed that the global auto industry loses approximately $80 billion annually because of demand that was forecast but never materialized, and the subsequent incentives required to sell these vehicles.[37] GM alone believes it could save its supply chain $12 billion annually by moving to a BTO system, and Ford has stated that BTO would allow it to cut its parts and materials inventories by 50 percent.[38] Nissan has estimated that if it were able to convert entirely to a BTO culture, it could save up to $3,600 per vehicle.[39] However, some argue that the concept of a single customer order moving through the automotive supply chain in a coordinated, timely, and cost effective manner is unfeasible, and that most customers really do not require the level of customization that BTO offers.

The International Car Distribution Programme (ICDP), based in the United Kingdom, is a group of 40 automotive companies, including GM and Ford, that is examining the distribution and sale of cars. Interestingly, the group has determined that, of the average 42 days it takes for a volume car to be delivered from the time it is ordered, 35 of those days, or over 80 percent of that time, is taken up by paperwork and scheduling. It only takes 2 days for the car to be built, and another 5 days for delivery.[40] Although some point out that a BTO system would be detrimental for automakers in times of market downturn, because auto plants generally need to work at 80 percent capacity to remain profitable and wide fluctuations in production levels lead to inefficiencies, ICDP believes that the rapidity with which customers want their custom vehicles delivered varies greatly, and that demand can be spread more evenly by offering certain incentives to buyers for particular delivery times.[41]

---

[36] Alisa Priddle, "Toledo Gives Birth," *Ward's Auto World*, Jan. 2001, p. 47.
[37] "A Long March," *The Economist*, July 20, 2001, found at Internet address *http://www.just-auto.com*, retrieved July 25, 2001.
[38] Lindsay Chappell, "Makers face challenge of '5-day car'," *Automotive News*, Jan. 22, 2001, p. 51.
[39] "A Long March."
[40] Ibid.
[41] Ibid.

The ICDP predicts that a 3-day car will be possible in the next decade, but identifies the painting part of the production line as a leading obstacle. The advent of spaceframes[42] and solid-color plastic panels as a replacement for the traditional steel monocoque, or solid one-piece body and chassis, could save at least 12 hours of production lead time; however, they require more components and higher levels of manual labor, and do not offer the same potential economies of scale.[43]

Nissan is reportedly aiming for a 14-day car in Japan and Europe, with less ambitious targets for the U.S. market. The company currently is running at 25-30 days in Japan and 40 days in the United States.[44] BMW is aiming for a 12-day turnaround on orders, and it projects it will trim that figure to 10 days by 2003.[45] Mitsubishi Motor Manufacturing of America has a form of BTO in place, where dealers are responsible for forecasting, up to 90 days out, what vehicles they will need on their lots. Mitsubishi can deliver dealer orders on a 5-week lead time.[46] GM reportedly intends to expand its successful BTO program in Brazil and establish BTO in its North American operations by the end of 2004. GM reports that its current order-to-delivery time has been reduced from 70 days to 47 days. GM is expected to launch BTO in North America with its Saturn division.[47]

Modular Assembly

Looking to Dell Computer as a prime example of a successful BTO company, it is apparent that the key to BTO success in the auto industry is to have standard modules that can be readily configured per customer order. Although the traditional model for auto manufacturing is to have the vehicle move down an assembly line as components are installed piece by piece, modular assembly shifts a large portion of the supply chain management and component integration responsibility to Tier 1 suppliers, which deliver a complete module – e.g., a cabin cockpit fitted with instrument clusters, airbags, audio equipment, and wiring – to the automaker. Studies reportedly have shown that the outsourcing of basic parts assembly to module producers could save automakers as much as 20 percent on production costs.[48]

The Big Three have reportedly experimented with modular assembly in plants in Mexico and Brazil, but face strong opposition in the United States from the UAW, which views this new mode of assembly as a threat to auto industry jobs. GM tried to bring a form of its Blue

---

[42] A spaceframe typically includes full-length frame rails and a safety cage in a single, welded unit, to which body panels are attached. The purpose of spaceframe construction is to eliminate material that is not contributing to the overall strength of the structure. Spaceframes are exceptionally stiff, offer above-average crash protection, and are substantially lower in weight.

[43] Colin Whitbread, "Paint shops delay progress of 3-day car," *Automotive News*, Dec. 4, 2000, p. 28N.

[44] Just-auto.com editorial team, "Nissan plans built to order to cut waste, speed delivery," Aug. 8, 2001, found at Internet address *http://www.just-auto.com*, retrieved Aug. 8, 2001.

[45] Chappell, "Makers face challenge of '5-day car."

[46] Larry Edsall, "An Illinois metamorphosis: Mitsubishis built to order," *Automotive News*, Apr. 9, 2001, p. 8N.

[47] "GM Delays Saturn Build-to-Order," *Ward's Automotive Reports*, vol. 76, No. 44, Oct. 29, 2001, p. 1.

[48] Lindsay Chappell, "Nissan's solution: Modules," *Automotive News*, Mar. 5, 2001, p. 1.

Macaw system in Brazil to its Lansing Grand River plant as Project Yellowstone. Although the plant does receive modules from suppliers, it did abandon the supplier-park-next-door aspect, and GM officials have placed significantly more emphasis on the plant's elimination of waste and the degree to which workers are in control.[49]

Japanese and European transplants, which are typically not unionized, have begun manufacturing with modules. For example, Nissan's new light truck plant in Mississippi plans to use modules extensively, with three main module suppliers onsite and four others within 2 miles. Modules will be delivered to the line as they are needed for particular vehicles.[50] Nissan's initial North American foray into a modified use of modules with the 2002 Altima at its Smyrna, TN, plant, reportedly provided a 5-percent cost savings and a 10-percent reduction in assembly time.[51]

Platform Sharing

Platform sharing among models is another way in which manufacturers are trying to cut costs and increase efficiency. Broadly defined, a platform is the vehicle's primary load-bearing assembly, determining the size of the vehicle and integrating driveline and suspension components. Platform sharing among partner automakers provides even greater savings potential when there are complimentary areas of expertise. Chrysler and Japanese partner Mitsubishi plan to share small- and mid-size platforms, reducing the two companies' 29 separate platforms to no more than 16.[52] Ford is embarking on a similar strategy, to be implemented by 2005, among certain Ford, Mazda, and Volvo models. Ultimately, 15 variations of 4 models, built in 5 or 6 countries, will come off a single platform.[53] GM and Japanese partners Subaru, Isuzu, and Suzuki intend to move from their current strategy of product cross-sourcing to a sharing of joint platforms for the Asia-Pacific region; ultimately, the companies may develop global platforms for their larger volume segments.[54] Some manufacturers, however, are not impressed with the trend toward consolidating platforms. Honda's president has stated that the use of common platforms would not allow the automaker to respond effectively to the diverse requirements of its customers.[55]

---

[49] Dave Guilford, "Storm before the calm," *Automotive News*, Jan. 21, 2002, p. 3; and Just-auto.com editorial team, "GM's new-ideas-in-action plant: Lansing Grand River," Feb. 18, 2002, found at Internet address *http://www.just-auto.com,* retrieved Feb. 26, 2002.

[50] Kim Willenson, "Nissan Canton Modular Mfg. Plan Will Put Three Suppliers in Main Compound, Five Others Nearby," *The Japan Automotive Digest*, vol. VII, No. 27, July 23, 2001, p. 1.

[51] "Nissan Embraces Modular Assembly," *Ward's Automotive Reports*, vol. 76, No. 47, Nov. 19, 2001, p. 3.

[52] James B. Treece and Robert Sherefkin, "Platform sharing key to profits," *Automotive News*, Mar. 5, 2001, p. 53.

[53] Bradford Wernle, "Ford, Mazda, Volvo will share small platform," *Automotive News*, Apr. 9, 2001, p. 39.

[54] Just-auto.com editorial team, "Interview with Rudolph A. Schlais, President, General Motors Asia-Pacific," Nov. 5, 2001, found at Internet address *http://www.just-auto.com*, retrieved Apr. 17, 2002.

[55] Ayako Doi, "Honda Turns Its Back on Industry Gospel That Fewer Platforms Equals Higher Profits," *The Japan Automotive Digest*, vol. VII, No. 15, Apr. 30, 2001, p. 1.

Design Advances

The construction and testing of prototypes is a very expensive and time-consuming part of the manufacturing process. Evolving computer-aided tools for 'virtual design' are enabling automakers to reduce the number of prototypes required; for example, GM reports that it has saved $100 million annually since 1998 and reduced its development cycle to 20-25 months from 33 months by decreasing the number of prototypes it uses.[56] Virtual design not only allows for fewer prototypes, it also speeds product development, enables crash testing without models, and facilitates parallel rather than sequential product development.[57] One industry observer predicts that, by 2005, virtual design capabilities will allow automakers to cut the number of required prototypes by 50 percent.[58]

Digital tools are also being applied to the construction of new auto plants and the revamping of older plants by creating and testing virtual assembly lines.[59] For example, DaimlerChrysler's new Toledo North Assembly Plant was designed and built electronically using 3D manufacturing simulation software. This technology allowed the company to build the line, assemble virtual products, and refine the process before any actual construction took place. The company estimates that it saved up to $4 million by avoiding costly changes that would have had to have been made during the construction phase.[60]

Toyota is reportedly moving the most aggressively with digital manufacturing by employing it in the design of its vehicles and manufacturing plants worldwide in a multi-pha plan. Toyota forecasts that, once fully implemented, its far-reaching system will cut development time by up to 50 percent.[61]

---

[56] "GM Cuts Prototypes, Saves $100 Million," *Ward's Automotive Reports*, vol. 76, No. 27, July 2, 2001, p. 3.

[57] However, some industry representatives have reported proportional distortions and difficulty with the software accurately rendering certain shapes. J.P. Vettraino, "Virtual vehicle design: The search for a new paradigm continues," *Automotive News*, Automotive News Design section, June 4, 2001, p. 4D-J.

[58] Chris Wright, "Virtual testing to cut number of prototypes," *Automotive News*, Jan. 14, 2002, p. 26S.

[59] "Toyota Digital Production Line Design System Cuts Time to Rollout by 75%," *The Japan Automotive Digest*, vol. VII, No. 44, Dec. 3, 2001, p. 7.

[60] Priddle, "Toledo Gives Birth," p. 47.

[61] Ralph Kisiel, "Toyota adopts digital carmaking," *Automotive News*, Apr. 8, 2002, p. 4.

The Internet and Manufacturing

Integrating operations via the Internet can be a cost-effective way to speed processes and ensure not only that all parties are working with identical parameters, but that all parties are apprised of changes and updates simultaneously. In 2002, Chrysler introduced its Internet-based Integrated Volume Planning program, which connects sales forecasting with supply and manufacturing requirements. This new system is expected to reduce order-to-delivery times, inventory, and tooling costs; and improve market responsiveness, sales forecast accuracy, and manufacturing efficiency.[62] GM is reportedly moving toward Internet-assisted data transfer and design with its suppliers to facilitate the use of consistent information.[63]

Productivity

There are a number of ways to measure productivity in the auto industry, including the number of cars produced annually per employee and number of hours to build a vehicle. In general, Japanese plants are considered to be the most productive in the world, followed by North American plants and then European plants. There are exceptions, however; for example, Nissan's plant in Sunderland, United Kingdom, is considered to be more productive than any plant in the United States.[64]

According to the 2002 Harbour Report, which is an annual report on the productivity of North American auto plants, in 2001 Nissan was the North American leader in overall labor productivity[65] for the eighth consecutive year at 29.00 hours to build a vehicle, up from 27.63 hours in 2001. Following Nissan were Honda at 31.18 (up from 29.11) and Toyota at 31.63 (up slightly from 31.06).[66] Japanese automakers' efficiency reportedly gives them at least a $500 cost advantage per vehicle.[67]

GM leapfrogged Ford to take fourth place with 39.34, an improvement over its rate of 40.52 hours in 2001. This was the first time GM finished ahead of Ford in overall productivity since the Harbour Report began tracking these statistics in 1989. In addition, when looking at plant productivity by vehicle categories, GM plants were the leaders in 7 of 14 categories.[68] GM also boasted 7 of the 10 most improved plants in 2001. GM has made great strides in productivity during 1997-2001, owing to lean manufacturing, quality

---

[62] "Chrysler Group to Redesign Production Planning Process to Better React to Market Changes," *The Autoparts Report*, vol. XV, No. 16, May 22, 2002, p. 1.

[63] "GM Cuts Prototypes, Saves $100 Million."

[64] Automotive World, "Productivity on the up-and-up," Oct. 23, 2000, found at Internet address *http://www.just-auto.com*, retrieved Oct. 30, 2000.

[65] Overall labor productivity combines stamping, engine, transmission, and assembly plant performance.

[66] Amy Wilson, "GM productivity roars past distracted Ford," *Automotive News*, June 17, 2002, p. 42.

[67] Alisa Priddle, "Efficiency by the Numbers," *Ward's Auto World*, July 2001, p. 57.

[68] GM plants were the productivity leaders in the compact car, mid-sized car, luxury car, full-sized sport-utility, full-sized pickup, minivan, and medium-duty truck categories. The other categories are subcompact car, large car, sports car, small sport-utility, mid-sized sport-utility, small pickup, and large van.

improvements, increased commonality among parts and among manufacturing systems, and improved vehicle designs in terms of ease to build.[69]

Ford slipped from fourth place to fifth at 40.88 (up from 39.94), and DaimlerChrysler came in last at 44.28, a slight improvement over its score of 44.81 in 2001.[70] Ford's productivity reportedly has been negatively affected by quality problems over the past couple of years that have necessitated assembly line changes to address these issues. Ford reportedly expects to improve its rating for 2002. Although DaimlerChrysler has lagged in productivity, its current manufacturing initiatives reportedly are expected to result in major productivity improvements in the coming years.[71]

GM advanced on Nissan in the category of top individual vehicle assembly plant in 2001;[72] its Oshawa, Ontario, plant pushed past Nissan's Smyrna, TN, plant with 16.79 hours to build a vehicle, compared to Smyrna's 17.30. Two of Ford's plants - Atlanta and Chicago - took the third and fourth spots with 17.78 and 18.31 hours, respectively.[73]

Vertical Integration

The degree of vertical integration in the U.S. motor vehicle industry has been reduced in recent years by the industry's efforts to become more efficient. Traditionally, mass production motor vehicle producers have used vertical integration to coordinate the complicated nature of designing and building motor vehicles; today, major motor vehicle producers worldwide, particularly those in the car and light truck segments, still produce most of their own engines, transmissions, and body stampings. For other components, motor vehicle producers rely on anywhere from several hundred to several thousand suppliers.

The automaker-supplier relationship changed significantly during the 1990s as a result of efforts to reduce costs, improve shareholder value, and improve competitiveness. Some automakers, most notably GM and Ford, have sold off certain partsmaking operations.[74] General trends during the 1990s include decreased supplier bases; increased automaker demands for lower prices from suppliers; increased outsourcing of tasks once performed by automakers;[75] and the delegation of supply chain management, including systems integration

[69] Wilson, "GM productivity roars past distracted Ford."
[70] Ibid.
[71] Ibid.
[72] This category is ranked by total hours at a plant divided by the total output.
[73] Wilson, "GM productivity roars past distracted Ford."
[74] GM spun off Delphi Automotive Systems in May 1999, and Ford spun off Visteon in June 2000.
[75] During the 1990s, automakers increased the outsourcing of services such as staffing, product design, document storage, quality analysis, and warranty management. One study reports that several years ago, suppliers accounted for 40 percent of the value of a new passenger vehicle; today that percentage is 60-70 percent, and it is expected to rise to 80 percent during the next decade. In addition, in 2000 suppliers accounted for 33 percent of product development responsibility; by 2010 this is expected to top 50 percent. Wolfgang Ziebart, "Building systems doesn't always build profits," *Automotive News*, June 3, 2002, p. 10.

responsibilities and the coordination of module assembly, to suppliers.[76] Indicative of the new responsibilities placed on suppliers, Chrysler is beginning to require that suppliers assume a certain portion of the costs associated with recalls and warranty repairs.[77]

The creation of online marketplaces for the automotive industry also promises to change the face of automaker-supplier relations. Components purchasing is generally estimated to be approximately half the cost associated with vehicle manufacturing, and a recent study has estimated that harnessing the Internet for business-to-business activity can save $1,063 per vehicle through improved inventory control, streamlined purchasing, reduced warranty costs, and improved productivity.[78] Suppliers were initially concerned that automakers would use these exchanges to further squeeze price concessions from them, and that confidential information posted on the Web would be compromised; some of these concerns may still linger.[79] However, many believe that, when these exchanges hit their stride, tremendous supply-chain management and product development benefits could be gained, resulting in reduced inventories, better quality control, and improved response time.[80]

Several e-marketplaces emerged in the late 1990s; perhaps the most widely known exchange is Covisint, which began operations in November 2000. Initially, Ford and GM in late 1999 announced plans to launch separate exchanges, but within months joined forces and invited DaimlerChrysler to join. Nissan and Renault also signed on early in the exchange's development. By March 2001, Toyota, Honda, Mitsubishi, Mazda, and 19 Japanese partsmakers had announced their intention to join,[81] and Peugeot joined in May 2001.[82] Covisint is available to suppliers as purchasers as well as automakers as purchasers, and as of January 2002, there were 5,000 automotive companies registered on Covisint, with 2,000 of those using the marketplace on a regular basis. Reportedly, 85 percent of the transactions on Covisint are for parts, modules, and systems that are incorporated into vehicles, as opposed to items like office supplies.[83] In March 2001, auto parts supplier ArvinMeritor claimed that a Covisint pilot auction reduced administrative purchase order costs from $90.00 to $5.00, and saved considerable time expended on the transaction, from 182 minutes to 22 minutes.[84] In addition to e-marketplace services, Covisint offers supply-chain management tools such as collaborative product development capabilities; however, as part

[76] Auto Business, Ltd., "Concentration wave creates new mega-suppliers: Consolidation driven by modularisation," Feb. 26, 2001, found at Internet address *http://www.just-auto.com*, retrieved June 20, 2002.

[77] Diana T. Kurylko and Robert Sherefkin, "DCX spells out vendor liability," *Automotive News*, June 10, 2002, p. 1.

[78] Evan Schulz, *Automobile Retail and Production in the Age of E-Commerce* (Washington, DC: Economic Strategy Institute, 2001), p. 32.

[79] Institute of the Motor Industry, "E-marketplaces: After the spin, what next?" Mar. 11, 2002, found at Internet address *http://www.just-auto.com*, retrieved Mar. 13, 2002.

[80] Ralph Kisiel, "Outsider's job: Ignite Covisint," *Automotive News*, Apr. 23, 2001, p. 1; and Brian Milligan, "What is Covisint?" *Purchasing*, Mar. 8, 2001, p. 35.

[81] "Japan's Top Automakers Expected to Join Covisint," *Japan Auto Trends*, Japan Automobile Manufacturers Association, vol. 5, No. 1, Mar. 2001, p. 2.

[82] Reuters, "Peugeot joins online exchange Covisint," May 22, 2001, found at Internet address *http://www.just-auto.com*, retrieved May 22, 2001.

[83] Ralph Kisiel, "Covisint 'scratching surface' of supplier sector," *Automotive News*, Jan. 21, 2002, p. 28.

[84] Ralph Kisiel, "Suppliers are warming up to online buying," *Automotive News*, Mar. 26, 2001, p. 16.

of recent downsizing efforts, Covisint is reportedly deemphasizing its supply chain management applications.[85]

While Covisint may have the most visibility, other e-marketplaces are also serving the auto industry. Some automakers, such as Volkswagen and BMW, are developing their own electronic purchasing relationships with their suppliers, and some suppliers, like Johnson Controls, have launched their own e-marketplace initiatives. FreeMarkets Inc. predates Covisint, and while it is not limited to the automotive industry, it boasts some high profile members from the automotive community, such as Delphi, Visteon, and Dana. Like Covisint, FreeMarkets is branching out into enabling Web-based product development capabilities.[86] In late 2000, German auto parts producer Robert Bosch and three other German suppliers formed the e-marketplace SupplyOn, which is open for business to all firms regardless of nationality.[87] In addition, Fiat owns 95 percent of Fast-Buyer, an online exchange based in Italy.[88] Toyota's North American arm is the majority shareholder in the new iStarXchange, which is open to all companies and is an exchange designed to serve the aftermarket for auto parts;[89] the Big Three launched a similar exchange for aftermarket parts called OEConnection in 2001.[90]

Vertical integration of forward linkages in the motor vehicle industry (linkages to vehicle purchasers) is limited. U.S. firms prefer to leave the process of selling vehicles to independent retailers (see section on Marketing Methods and Pricing Practices). The most notable integration of forward linkages is in terms of automakers' ownership or equity participation in daily rental car agencies which serve as an important source of high-volume, although low profit, sales for automakers. Automakers also have financial subsidiaries which serve as potential credit issuers to automobile purchasers.

Producers of commercial vehicles (trucks and buses) are reportedly moving to strengthen their downstream integration, with some of them expanding their financing operations, offering leasing services, and/or generally moving towards becoming freight transportation facilitators.[91] Profit margins are very slim for truckmakers, and the shift toward truck and bus manufacturers assuming the financial risk for their vehicles' maintenance, currency conversions, consumer credit, and residual value depreciation can be very profitable. Industry observers note that, as most trucks are comparable in terms of quality and

---

[85] Just-auto.com editorial team, "Covisint to cut workforce by a third," June 28, 2002, found at Internet address *http://www.just-auto.com*, retrieved June 28, 2002.

[86] Mike Arnholt, "Tying It All Together," *Ward's Auto World*, June 2001, p. 32.

[87] Wim Oude Weernink, "SupplyOn launch imminent, says Bosch," *Automotive News*, Dec. 4, 2000, p. 28V.

[88] "Purchasing chiefs develop distinct e-buying strategies," *Automotive News*, Dec. 4, 2000, p. 28T.

[89] "Toyota Launches Parts Network," *Ward's Automotive Reports*, vol. 75, No. 9, Feb. 28, 2000, p. 5.

[90] For more information, see *http://www.oeconnection.com.*

[91] The Economist Intelligence Unit, "The World Heavy Truck Industry: Structural Change Ahead," Dec. 27, 1999, found at Internet address *http://www.just-auto.com*, retrieved Apr. 30, 2002.

reliability, the level of leasing and service options offered by commercial vehicle manufacturers will continue to gain in importance.[92]

Marketing Methods and Pricing Practices

The U.S. auto dealership industry consolidated significantly during 1997-2001. The dealership community is increasingly dominated by large multifranchise operations that seek high unit volume and are often willing, and able, to take a smaller profit per vehicle sold. These dealerships are well financed, advertise extensively, and tend to cluster a variety of brands on one property.[93] In 1996, the leading 100 dealership groups accounted for 8.5 percent of light vehicle unit sales in the United States; by 2001, the top 100 accounted for 16.1 percent. Moreover, the top 10 dealership groups account for 50 percent of the new vehicle sales of the top 100. The two leading dealership groups in 2001 were AutoNation Inc., with 454,000 new retail sales, and UnitedAuto Group Inc., with 141,056.[94]

Although the retail segment of the motor vehicle industry has traditionally been largely independent of U.S. producers, increasing competition within the industry has forced changes in the distribution network. During the latter half of the 1990s, the Big Three concentrated efforts on consolidating their dealerships and reducing distribution expenses, which account for some 30 percent of the price of a new vehicle. However, GM was dissuaded from a plan to purchase up to 10 percent of its dealers after independent dealers strongly protested.[95] Similarly, Ford, after purchasing 30 Ford dealers beginning in 1998, decided to sell them under extreme pressure from independent dealers. Ford's plan, dubbed Auto Collection, called for the automaker to consolidate its dealer network and jointly own dealerships with independent dealers.[96] Not only is the notion of factory-owned dealerships opposed by independent dealers, such dealerships are banned in some States.[97] In 2000, Ford instituted its Blue Oval Dealer Certification program (which entered into effect with the start of the 2001 model year), again raising the ire of many in the dealership community.[98] Certification is granted on an annual basis, and is based on a set of clear standards for outstanding sales and customer service. Certified dealers receive a customer satisfaction financial award on each eligible new vehicle, among other benefits. A cadre of State dealer groups planned to take Ford to court for what they consider to be illegal price discrimination.[99] Chrysler also maintains a dealer certification program known as Five Star; this program was introduced in 1997.

---

[92] Tim Burt, "Contract hire gathers pace," Sept. 21, 2000, Financial Times Electronic Publishing, found at Internet address *http://today.newscast.com*, retrieved Sept. 22, 2000.

[93] Office of Automotive Affairs, U.S. Department of Commerce, "Motor Vehicles," *U.S. Industry and Trade Outlook 2000*, p. 36-4.

[94] Arlena Sawyers, "Biggest dealer groups gained share in 2001," *Automotive News*, Apr. 15, 2002, p. 1.

[95] Justin Hyde for Reuters, "Ford exiting car dealer business," June 27, 2001, found at Internet address *http://www.just-auto.com*, retrieved June 27, 2001.

[96] Ibid.

[97] Ibid.

[98] Mary Connelly, "Dealers rip Ford certification," *Automotive News*, May 29, 2000, p. 1.

[99] Mary Connelly, "Blue Oval Battle Looms for Ford, Dealers," *Automotive News* article recapped in American International Automobile Dealers Association newsletter, *First UP*, Mar. 19, 2001.

Motor vehicle producers typically devise production schedules on the basis of expected demand for their products, and then ship the vehicles in response to orders from dealers. Although a reported 90 percent of U.S. car purchasers buy vehicles off a dealer lot, in Japan 50-60 percent of the vehicles produced were ordered by customers, and another 30-40 percent have potential customers waiting. The European system falls in the middle, with 30 percent of vehicles produced being custom orders and the remaining 70 percent built based on marketing forecasts for distribution to dealers.[100] In most cases, producers hold only very limited inventory of the finished product, although during severe sales declines, automakers may build a large inventory, especially if they are reluctant to make substantial reductions in production.

During the latter half of the 1990s, the Internet was expected to revolutionize the auto manufacturing and distribution system by allowing consumers to custom-build their vehicles online and eliminating costs associated with the dealership sales infrastructure. Within a couple of years, however, it became apparent that this revolution would be more of an evolution, and that in the short term, the Internet is more readily suited as a means for automakers and dealers to cultivate customer relations, and for shoppers to gather information about vehicle options, specifications, pricing, dealer incentives, trade-in values, purchase financing, independent vehicle reviews, and cross-brand comparisons.[101] One recent study reports that, used effectively, the business-to-consumer Internet strategies may allow for total savings for manufacturers and dealers of around $1,000 per vehicle on field support, freight, sales commissions, inventory, and dealer overhead.[102]

Although consumers cannot currently purchase passenger vehicles directly from automakers, the Internet offers consumers a way to interact with automakers in the buying process. Programs such as GM BuyPower and FordDirect.com have the automakers and dealers teamed to simplify the buying process by allowing customers to custom-build and price a vehicle, search for a local dealer, search dealer inventories, and apply for financing – all online. The sites boast 70,000 and 80,000 leads per month, respectively, which are then passed on to dealers for follow-up.[103]

Third-party Internet buying services that refer customers to dealers did not live up to initial expectations.[104] Companies such as CarOrder.com, DreamLot.com, Autoweb.com, CarsDirect.com, and Autobytel.com have been forced to change their business model, or have gone out of business altogether.[105] Some say this business model foundered because firms were unable to earn a profit from every transaction, and could not prove that they

---

[100] Drew Winter, "Nissan Aiming for 14-day Car in Japan and Europe," *Ward's Auto World*, Aug. 2000, p. 18.

[101] Maryann Keller, "Caught in the Web," *Automotive Industries*, Mar. 2001, p. 37.

[102] Schulz, *Automobile Retail and Production in the Age of E-Commerce*, p. 23.

[103] Ralph Kisiel, "Panel: The bubble's gone, but e-biz lives on," *Automotive News*, Jan. 21, 2002, p. 25.

[104] "E-Dealers' And Manufacturers Will Dominate Automotive Sales On The Internet AutoNation CEO Says," *The Autoparts Report*, vol. XIII, No. 24, June 20, 2000, p. 8.

[105] Tim Moran, "Whipped on the Web," *Automotive News*, Automotive News Insight section, Jan. 29, 2001, p. 20i.

added sustainable value to the purchase process.[106] When compared to products that are successfully marketed via the Internet, such as airline tickets and books, the volume of automotive sales is rather small at 33,000-34,000 per day; the fees earned from each referral or transaction are not enough to cover costs and earn a profit.[107] According to one expert, “the Internet intermediary appears to be adding costs to a low-margin business, and that isn’t a viable business proposition.”[108] Although there are direct brokers and national dealership websites that sell vehicles directly over the Internet, many argue that customers do not want to give up the ‘test-drive, kick-the-tires’ experience of buying off a dealer lot. There is no question, however, that the Internet has become a critical tool for passenger vehicle purchasers as a means to arm themselves with information about vehicle options, pricing, availability, and cross-brand comparisons before beginning the process of shopping at a dealership.

Currently, there is a debate among industry observers as to the role that dealers will and should play in the future, and the validity of franchise laws. Some argue that the current passenger vehicle distribution system is anticompetitive, and that replacing the current franchise system with an Internet-based system would save consumers a considerable amount of money via the elimination of market power and gains in efficiency.[109] Others claim that the projected savings are overstated, and that franchise laws and the current dealer-distribution system are valid and exist in the best interest of consumers as well as small businesses.[110]

Pricing practices in the automotive retail sector have also come under increased scrutiny as dealers and manufacturers make limited attempts to make purchasing a vehicle a less unpleasant experience for consumers. Manufacturers set suggested retail prices for autos, but in practice, these prices are generally considered to be, by both customers and dealers, a starting point for negotiation. In most instances, customers pay less than the manufacturers’ suggested retail price (MSRP), and “haggling” between customer and the salesperson is common practice, although most consumers consider the experience unpleasant. The final sales price of the vehicle is largely related to the supply of the vehicle make or model relative to demand. Popular makes or models are sold at prices closer to the MSRP; in some cases, dealers charge more than the MSRP, especially when very popular models are introduced and demand exceeds supply. GM’s Saturn division is an exception in the industry. Saturn has a "No-Hassle, No-Haggle" sales policy, whereby dealers generally sell at posted prices.[111] This practice is considered to be a key aspect of Saturn’s high level of customer satisfaction. Other dealerships have adopted this approach with varying degrees of success, but price negotiation is still standard practice at most dealerships.

---

[106] Ibid.

[107] Keller, “Caught in the Web.”

[108] Ibid.

[109] See Mark Cooper, Director of Research, Consumer Federation of America, “A Roadblock on the Information Superhighway: Anticompetitive Restrictions on Automotive Markets,” Feb. 2001.

[110] See Brian Shaffer, Ph.D., University of Maryland, for the National Automobile Dealers Association, “An Assessment of Franchise Laws And Internet Auto Sales,” Aug. 2001, found at Internet address *http://www.nada.org/pdf/shaffer_report.pdf*.

[111] See *http://www.saturnbp.com/company/our_story/saturn_experience/* for more information about Saturn.

Manufacturers often offer various types of discounts and financial incentives that lower the cost of the vehicles to the dealers. These price mechanisms are typically passed on to the consumer to stimulate sales. There are various types of incentives offered to customers, including simple discounts, rebates, and low-interest financing. There has been much discussion within the U.S. auto industry regarding the prudence of incentives. The practice is costly to manufacturers, which often end up in "incentive wars" that reduce profits. In the passenger vehicle industry, the Big Three tend to rely heavily on incentives, whereas the practice is less prevalent among Japanese- and European-owned producers. Incentives have been generous and widely used in the post-September 11, 2001 environment, with low- and no-interest financing and cash-back promotions offered by the Big Three as well as some foreign-based automakers to bolster flagging sales during the months immediately following the terrorist attacks on the United States.

Research and Development

The U.S. automotive industry spends over $18 billion annually in research and development (R&D) of new advanced technologies aimed largely at four areas: emissions, fuel efficiency, safety, and performance. The automotive industry reports that it devotes more funds to R&D than any other manufacturing industry.[112]

Although companies have their own market objectives and competition is fierce, the automakers recognize the benefits of working together on key areas of precompetitive research. According to a former Ford official, "Consortia are an efficient way to conduct research and evaluate alternatives, concentrating research and development on the most promising technologies. By pooling resources, we are better able to tackle the technological hurdles that will affect the entire industry. The societal benefit of such joint efforts is improved products on the market sooner."[113] There are many private-sector partnerships among automakers, and among automakers and suppliers, that foster cooperation in joint basic research as well as joint development of new technologies.

Although the Big Three are competitors in the marketplace, they work together on shared technological and environmental concerns under the umbrella of the United States Council for Automotive Research (USCAR). USCAR was formed in 1992 by the three companies, with the following objectives:

- Monitoring current research projects and considering new opportunities.
- Coordinating the industry's interaction with government researchers.
- Sharing results of joint projects with member companies.
- Seeking and directing funding from public and private sources for joint R&D.
- Providing facilities and administration for consortia.

---

[112] The Alliance of Automobile Manufacturers, found at Internet address *http://www.autoalliance.org/facts.htm*, retrieved Oct. 23, 2001.

[113] Statement of retired Ford USCAR member Bill Powers, found at *http://www.uscar.org/uscar/whois.htm*, retrieved Apr. 24, 2002.

The Partnership for a New Generation of Vehicles (PNGV) program was initiated in September 1993 as a forum for collaborative basic research into technologies that would result in a new class of vehicles that would get up to 80 miles per gallon without sacrificing affordability, utility, safety and comfort.[114] PNGV members included GM, Ford, Chrysler, and 7 Federal agencies, as well as more than 400 organizations, including auto industry suppliers, universities, the national laboratories, aerospace firms and small entrepreneurial firms. PNGV accomplishments included significant work on hybrid-electric vehicles, fuel cells, compression-ignition direct-injection engines, lithium ion batteries, polymer composites and structural reaction injection molding, aluminum and continuous slab casting, steel space-frame vehicle structure, vehicle simulation and virtual modeling, and advanced computational methods.[115]

The PNGV program was to culminate in the production of prototype family autos in the year 2004, with the expectation that the technologies would be incorporated into even more efficient production vehicles about 4 years later. However, a National Research Council Peer Review issued in August 2001 concluded that the program was not likely to reach its goal and recommended a restructuring of the PNGV program to reflect more accurately industry developments and changing market conditions. Reportedly, emissions became a stumbling block contributing to the failure of PNGV, as the program was aiming to achieve emissions goals that were below standards set separately by the EPA, to be implemented in 2004. The government reportedly spent $814 million on PNGV, while the industry spent over $980 million.[116]

In evaluating the former PNGV program, the U.S. Department of Energy (DOE) and auto industry partners agreed that public/private partnerships are the preferred approach to R&D. However, it was agreed that cooperative efforts must be refocused on longer range goals, with greater emphasis on energy and environmental concerns; fundamental R&D at the component and subsystem level; coverage of all light vehicle platforms; technologies that offer early opportunities to save petroleum; and technologies applicable to both fuel cell and hybrid approaches (e.g., batteries, electronics, and motors).[117]

In January 2002, U.S. Secretary of Energy Spencer Abraham and executives of GM, Ford, and DaimlerChrysler announced a new cooperative automotive research partnership between the DOE and USCAR called FreedomCAR (Cooperative Automotive Research). The goal of this new partnership is the development of a hydrogen fueled vehicle. According to Secretary Abraham, FreedomCAR "is rooted in President Bush's call, issued last May in (the Administration's) National Energy Plan, to reduce American reliance on foreign oil through a balance of new domestic energy production and new technology to promote greater energy

---

[114] USCAR, "Who is USCAR?" found at Internet address *http://www.uscar.org/uscar/whois.htm*, retrieved Apr. 24, 2002.

[115] USCAR, "Examples of PNGV Technical Accomplishments," found at Internet address *http://www.uscar.org/pngv/accomp.htm*, retrieved Apr. 24, 2002.

[116] "U.S. DOE starts Freedom CAR, retires PNGV," Jan. 12, 2002, found at Internet address *http://www.dieselnet.com/news/0201doe.html*, retrieved Apr. 24, 2002.

[117] Office of Advanced Automotive Technologies, U.S. Department of Energy, "FreedomCAR Fact Sheet," found at Internet address *http://www.cartech.doe.gov/freedomcar/freedomcar-facts.html*, retrieved Apr. 24, 2002.

efficiency."[118] FreedomCAR will focus on technologies to enable mass production of affordable hydrogen-powered fuel cell vehicles and the hydrogen-supply infrastructure to support them.[119]

R&D efforts in the automotive industry have focused on several other technologies over the past 5 years, including diesel technology, integrated starter-generators, cylinder deactivation, continuously variable transmissions, clutchless manual transmissions, active suspension, ultrasonic park assist technology, and night vision technology. There have been many electronic advances, such as drive-by-wire, steer-by-wire, brake-by-wire, electronic stability control, adaptive cruise control, advanced airbag systems, tire pressure monitoring, powertrain control systems, digital radio, hands-free phones, telematics, and rear-seat entertainment systems. In addition, research is ongoing concerning the transition to 42-volt alternators to handle the demands that future electrical systems in vehicles will require.[120]

The commercial vehicle industry reportedly is not as quick to adopt new technologies, as commercial vehicle customers must be convinced that the new technology will lower the operating costs of the vehicle in order to accept the higher purchase price and associated maintenance costs. This constraint notwithstanding, there are numerous recent developments in commercial vehicle technology in the areas of reduced fuel consumption through electronic fuel injection systems and improved aerodynamics; improved efficiency, both in terms of the durability of the truck and the facility of usage; and enhanced safety and comfort for drivers.[121]

---

[118] Remarks by Spencer Abraham on FreedomCAR, Detroit, MI, Jan. 9, 2002, found at Internet address *http://www.energy.gov/HQDocs/speeches/2002/janss/FreedomCar.html*, retrieved June 20, 2002.

[119] "U.S. DOE starts Freedom CAR, retires PNGV." Reportedly, DOE officials claim that work on PNGV initiatives such as gasoline- or diesel-electric hybrid vehicles and light-weight materials will continue. Harry Stoffer, "FreedomCAR: Real solution or tax waste?" *Automotive News*, June 10, 2002, p. 1.

[120] For more on these technologies, see Frost and Sullivan, "Intelligent technologies ahead," Jan. 25, 2002, found at Internet address *http://www.just-auto.com*, retrieved Jan. 30, 2002; Richard Truett, "Supply and demand," *Automotive News*, Automotive News Insight section, Oct. 8, 2001, p. 2i; and Paul Hansen, "Current Trends," *Automotive Industries*, July 2001, p. 28.

[121] Sylvia Enders, "Challenges in the Global Truck Market - The Truck Industry on the Road to High Technology," ch. in Ralf Landmann, Heiko Wolters, Wolfgang Bernhart, and Holger Karsten, eds., *The Future of the Automotive Industry: Challenges and Concepts for the 21st Century* (Warrendale, PA: Society of Automotive Engineers, 2001), pp. 46-48.

Regulatory Issues

In general, Government regulations regarding passenger vehicles cover fuel economy, safety, and pollution control or emissions. There are also mandates regarding labeling and taxes. It is challenging for automakers to meet the demands of all the mandates; for example, one way to increase fuel economy is to lighten vehicle weight by using lighter materials. However, this change may make the vehicle less safe in crash situations. In addition, consumer demands in recent years have run counter to government regulations. Light trucks – particularly SUVs – have gained tremendously in popularity in recent years; however, these are typically the least fuel-efficient passenger vehicles available. Regulatory issues for commercial vehicles tend to focus on emissions and safety issues, and there are also Buy America provisions that apply to Federally funded transit projects.[122]

Fuel Economy

Following the 1973-74 oil embargo and energy supply crisis, the U.S. Congress enacted the Energy Policy and Conservation Act of 1975 (EPCA)[123] to reduce U.S. dependence on foreign oil. Title III of EPCA added Title V to the Motor Vehicle Information and Cost Savings Act.[124] Title III required the Secretary of Transportation, who delegated the authority to the National Highway Transportation Safety Administration (NHTSA),[125] to establish mandatory average motor vehicle fuel economy standards for passenger automobiles and light trucks.[126] These standards are referred to as corporate average fuel economy standards (CAFE).[127] CAFE standards apply generally to any domestic or foreign vehicle manufacturer that manufactures (whether or not in the customs territory of the United States) 10,000 or more passenger cars in a model year.

The EPCA required the Environmental Protection Agency (EPA) to determine the methodology for calculating average fuel economy, and manufacturers failing to meet the

---

[122] 49 U.S.C. 5323(j) sets out the U.S. Department of Transportation Federal Transit Administration's (FTA) requirements concerning domestic preference for federally-funded transit projects; specifically, all rolling stock procured with FTA funds must have a domestic content of at least 60 percent and must undergo final assembly in the United States.

[123] P.L. 94-163, Title III, Dec. 22, 1975, 89 Stat. 901.

[124] P.L. 92-513, Title V, 15 U.S.C. 1901 et. seq.

[125] See 49 CFR 1.50. NHTSA is part of the U.S. Department of Transportation, and was founded in 1970 after the passage of the Highway Safety Act of 1970.

[126] NHTSA maintains a broad definition of light trucks. To be held to the less rigorous fuel economy standard for light trucks, a vehicle must have just one of the following characteristics: transports property on an open bed; provides greater cargo-carrying than passenger-carrying volume; has seats that can be removed to create a flat floor; transports more than 10 people; provides temporary living quarters; has four-wheel or all-wheel drive; and has a gvw of 6,000 pounds and meets regulations for axle ground clearance. 49 CFR 523.5. Under this definition, minivans, SUVs, cross-over vehicles, pickup trucks, and some sedan-type vehicles like Chrysler's PT Cruiser are classified as light trucks. Because light trucks currently account for half the passenger vehicle market and are largely used for personal transportation rather than for work/cargo-carrying functions, NHTSA is currently considering a redefinition of light trucks, with the possibility of creating several new vehicle categories. Harry Stoffer and Rick Kranz, "Feds rethink truck definition," *Automotive News,* May 13, 2002, p. 1.

[127] Fuel economy standards are set out in 49 CFR 531.5.

standard are liable for civil penalty.[128] The passenger car standard, which is 27.5 miles per gallon (mpg), has not been increased since the 1986 model year. The CAFE standard is lower for light trucks and was set on an annual basis; however, the light-truck CAFE standard has been frozen at the model year 1996 level of 20.7 mpg (through model year 2003) by provisions in the U.S. Department of Transportation's (DOT) annual appropriations acts.[129] The Appropriations Act for FY 2002 passed by the House and Senate allowed NHTSA to begin rulemaking to set the light truck standard for model year 2004.[130] Under the CAFE law, a standard must be issued for a model year not later than 18 months before the model year begins; therefore, NHTSA was to issue the model year 2004 standard by April 1, 2002. NHTSA issued a continuation of the 20.7 mpg standard, saying that the 6-month period it was afforded did not allow for a meaningful reevaluation of the current standard.[131]

Each manufacturer can have three fleets for CAFE purposes: A domestic passenger car fleet, an import passenger car fleet, and a light truck fleet (light truck fleets are not separated into domestic or import fleets). An automobile is considered to be domestic if at least 75 percent of the content is in U.S. materials or value added in the United States or Canada. Manufacturers must meet the prescribed CAFE averages through the production of vehicles or by accumulating credits in each class. Credits cannot be traded within fleets; they can be only applied to the fleet for which they are earned. Thus, credits earned by a manufacturer's import passenger car fleet cannot be applied against its domestic passenger car fleet or its light truck fleet. Credits can be used to offset shortfalls in three previous or subsequent model years.[132]

The CAFE debate resurfaced in 2001-2002 as the Administration began to examine whether it should set new standards for the 2005-2010 model years. A number of bills were introduced in the House and Senate proposing to raise average fuel economy standards to various levels.[133] The most extreme of these, H.R. 2614, would raise the combined passenger car and light truck fuel economy standard to 40 mpg after model year 2011.[134]

---

[128] This penalty is $5.00 multiplied by each tenth of a mpg that the applicable average fuel economy standard exceeds the average fuel economy and multiplied by the number of automobiles covered by the standard and manufactured by the manufacturer in a model year.

[129] Statement of L. Robert Shelton, Executive Director, National Highway Traffic Safety Administration, before the Committee on Energy and Natural Resources, United States Senate, July 17, 2001, found at Internet address *http://www.nhtsa.dot.gov/nhtsa/announce/testimony/EnergyStatement.html*, retrieved Apr. 10, 2002.

[130] 67 FR 3470, Jan. 24, 2002.

[131] 67 FR 26052, Apr. 4, 2002. See also USDOT press release, "NHTSA Publishes Final Model Year 2004 CAFE Standard for Light Trucks," Apr. 1, 2002, found at Internet address *http://www.dot.gov/affaris/nhtsa2002.htm*, retrieved Apr. 29, 2002.

[132] 49 CFR 535.

[133] These include S. 804 (introduced May 1, 2001); H.R. 1815 (introduced May 10, 2001); H.R. 2614 (introduced July 24, 2001); S. 1923 (introduced Feb. 7, 2002); and S. 1926 (introduced Feb. 8, 2002).

[134] In addition, introduced on March 13, 2002, the Kerry-McCain amendment (S.A. 2999) to the U.S. Department of Energy appropriations bill S. 517 proposed to raise CAFE by 50 percent within a decade.

(continued...)

A report issued in 2001 at the behest of Congress by the National Academy of Sciences concluded that significant fuel economy gains can be made without sacrificing vehicle size or horsepower using existing technology. "Some technologies already in existence today could significantly reduce fuel consumption of new cars over the next 15 years, with light-duty trucks having the greatest potential reductions. These technologies, which would increase the purchase price of new cars and trucks, include engine advances that reduce friction, such as variable valve timing, and more efficient powertrains, such as five-speed automatic transmissions."[135] The report suggests that policy makers pursue the following suggestions to correct the structural flaws in the CAFE system: (1) adopt tradable fuel economy credits; (2) switch to attribute-based standards;[136] (3) eliminate the two-fleet (domestic and import) rule; (4) eliminate dual-fuel vehicle credits;[137] and (5) pursue government-industry R&D.[138]

For model year 2002, there are 10 passenger vehicles that get at least 45 mpg on the highway; the leading 3 are gasoline-electric hybrids, and all 10 are produced by Honda, Toyota, and Volkswagen.[139] Federal tax credits of up to $2,000 are available on electric vehicles, to be phased out by 2005.[140] Tax deductions of up to $2,000 on gasoline-electric hybrids were announced by the Internal Revenue Service in May 2002.[141] In addition, various States also offer tax breaks on clean fuel vehicles. However, despite fuel economy regulations and consumer incentives, a recent report by the EPA found that all of the passenger vehicles (cars and light trucks) sold in the United States in the 2001 model year averaged just 20.4 mpg – the lowest average in over 20 years.[142] According to a U.S. industry representative, there are some 50 models available in the U.S. market that get at least 30 mpg highway, but most are weak sellers; light trucks and vehicles with comparatively greater weight and horsepower are currently quite popular.[143]

---

[134](...continued)
148 Cong. Rec. S1859-01, *S1859. The amendment was withdrawn on April 18, 2002. 148 Cong. Rec. S2893.

[135] National Academies press release, "Federal Fuel Economy Standards Program Should Be Retooled," July 31, 2001, found at Internet address *http://www4.nationalacademies.org/news.nsf/*, retrieved Apr. 10, 2002.

[136] An attribute-based system would set standards for vehicles grouped by attribute, e.g., weight, instead of vehicle type, i.e., car or light truck.

[137] Credits are earned for vehicles that can burn ethanol as well as gasoline; however, gasoline is the predominant fuel typically used in dual-fuel vehicles, and the credits can be used to compensate for less efficient vehicles, providing for a potential negative effect on overall fuel economy.

[138] National Academies press release.

[139] U.S. Department of Energy and U.S. Environmental Protection Agency, "2002 Fuel Economy Guide" found at Internet address *http://www.fueleconomy.gov/feg/FEG2000.htm*, retrieved Nov. 8, 2001.

[140] IRS pub. 535.

[141] Internal Revenue press release, "IRS Moves to Clarify Taxpayer Deduction for Hybrid Vehicles," release No. IR-2002-64, May 21, 2002, found at Internet address *http://www.irs.gov/pub/irs-news/ir-02-64.pdf,* retrieved July 1, 2002.

[142] U.S. Environmental Protection Agency, Office of Transportation and Air Quality, "Light-Duty Automotive Technology and Fuel Economy Trends 1975 Through 2001," found at Internet address *http://www.epa.gov/otaq/fetrends.htm*, retrieved Nov. 8, 2001.

[143] Harry Stoffer, "Fuel economy remains a hard sell," *Automotive News*, Oct. 15, 2001, p. 40.

Safety and Emissions

Although most countries use a type approval system,[144] the U.S. system that ensures that new vehicles meet all safety and environmental regulations is known as self-certification.[145] In this system, all manufacturers marketing vehicles in the United States assume responsibility and liability for engineering and testing a vehicle to ensure that it meets the U.S. Government's regulatory requirements. Every vehicle is certified by the manufacturer at the point of manufacture as meeting all applicable Federal Motor Vehicle Safety Standards.[146]

NHTSA is the key government agency in the establishment and enforcement of safety standards for motor vehicles.[147] NHTSA conducts independent crash testing of many new vehicles and then scores them using a five-star rating system.[148] NHTSA's safety research results form the foundation for the drafting and enforcement of safety-related regulations that affect the design, manufacture, and use of restraint systems in motor vehicles. Federal Motor Vehicle Safety Standard 208, Occupant Crash Protection,[149] sets out standards for restraint systems, which are constantly reviewed and revised as vehicles change and technology develops. Suppliers of restraint systems generally consider 208 to be a baseline, aiming to exceed the government standards. However, cost considerations often must be factored in when deciding how far to go with safety equipment.[150] NHTSA is also responsible for investigating manufacturer defects.[151]

---

[144] Under the type approval system, motor vehicle manufacturers (including foreign motor vehicle manufacturers and dealers of imported motor vehicles) typically have to file an application with the appropriate government agency, and submit sample vehicles for testing. For more information about how the type approval system works, see *http://www.mlit.go.jp/english/public_comment/pubcom1/pubcom1_4.pdf* (Japan); *http://www.vca.gov.uk/ (United Kingdom);* or *http://rvcs-prodweb.dot.gov.au/cert.html* (Australia). For imported vehicles, some governments, such as the Government of Japan, accept foreign technical standards that are equivalent to their own, provided the manufacturer provides test data from approved foreign testing institutes. In addition, some countries will dispatch officials to foreign motor vehicle manufacturing plants for onsite testing of motor vehicles to be imported into that country. For more information, see *http://www.jama.or.jp/14_english/pdf/MIJ2001.pdf.*

[145] 49 U.S.C. 30115; 49 CFR 567.

[146] Ibid.

[147] For information on NHTSA's mission, see *http://www.nhtsa.dot.gov/nhtsa/whatis/overview/*.

[148] In recent years NHTSA has expanded its crash-test program to include not only front-impact testing but side-impact testing as well. Congress also passed legislation in 2001 mandating the agency to begin conducting rollover tests on SUVs and pickup trucks.

[149] 49 CFR 571.

[150] Eric Mayne, "Under Restraint," *Ward's Auto World*, Apr. 2002, p. 19.

[151] NHTSA serves as a clearinghouse for safety-related information to the public, and funds internal studies on child safety seats, teen driver programs, new safety technologies, and a host of other programs that monitor and seek to improve safety. NHTSA also commissions safety studies and/or gives grants to states, cities, universities, and organizations such as the AAA Foundation of Traffic Safety and other nonacademic research facilities to conduct their own safety research. NHTSA is also responsible for setting and monitoring fuel economy standards (see section on Fuel Economy).

In the realm of emissions standards, the Clean Air Act of 1970[152] gave the EPA broad authority to regulate motor vehicle emissions, and the standards have become progressively more stringent since then. Vehicle emissions are being further reduced by provisions of the 1990 Clean Air Act Amendments (CAAA).[153] As part of the CAAA, 39 metropolitan areas with excessive smog were identified and required to use cleaner-burning fuels beginning with the 1998 model year.[154] The State of California, through the California Air Resources Board, has mandated emissions standards more stringent than those enforced by the EPA, and several Northeastern States have followed California's lead.[155]

Because designing and developing different versions of a particular model in order to satisfy differing regulatory and certification requirements can add as much as 10 percent to the cost of a vehicle,[156] efforts to harmonize motor vehicle technical regulations on a global scale gained momentum during the late 1990s. On March 12, 1998, following a year of intense negotiations, the United States, the European Commission (EC), and Japan presented the text of the draft Agreement Concerning the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts (the Global Agreement) to the United Nations Economic Commission for Europe Working Party 29 (UN/ECE WP.29).[157] The agreement establishes a global process for developing new global technical regulations where there are no existing standards, as well as harmonizing existing regulations, and aims to ensure high levels of environmental protection, safety, energy efficiency, and anti-theft performance. In order for the Global Agreement to enter into force, eight countries or regional economic integration organizations had to become Contracting Parties (one of which had to be the European Union (EU), Japan, or the United States). The United States was the first country to sign the Global Agreement on June 25, 1998; the next six signatories were Canada, Japan, France, the EU, Germany, and South Africa. During July 2000, the Russian Federation became the eighth signatory, enabling the Global Agreement to enter into force on August 25, 2000.[158]

With the support of at least one-third of the members, a government can enter a standards proposal in a compendium of candidate regulations. A consensus on the proposal would make it binding. However, the agreement does not obligate Contracting Parties to adopt a regulation into their own laws, and explicitly recognizes the right of national and subnational authorities to adopt and maintain technical regulations that are more stringently protective of health and environment than those established at the global level. If a contracting party votes to establish a regulation, then it must initiate the domestic procedures to adopt the

---

[152] P.L. 91-604, Dec. 31, 1970, 84 Stat. 1676.

[153] P.L. 101-549, Nov. 15, 1990, 104 Stat. 2399.

[154] Office of Automotive Affairs, "Motor Vehicles," p. 36-5.

[155] For more information, see the California Air Resources Board website, *http://www.arb.ca.gov/msprog/zevprog/2000review/zevben.pdf*.

[156] Office of Automotive Affairs, U.S. Department of Commerce, "Transatlantic Automotive Industry Conference on International Regulatory Harmonization: Overall Conclusions," Apr. 11, 1996, found at *http://www.ita.doc.gov/industry/basic/chapeau.html*, retrieved Sept. 5, 1997.

[157] The full text of the agreement can be found at *http://www.unece.org/trans/conventn/globaut.pdf.*

[158] UN/ECE press release, "Global Agreement on Vehicle Regulations Set To Enter Into Force," ECE/Trans/00/9, Geneva, Aug. 4, 2000, found at Internet address *http://www.unece.org/press/00trans9e.htm.*

regulation.[159] In June 2000, an agreement was reached among members of the International Organisation of Motor Vehicle Manufacturers to start establishing from 2002 standardized global technical standards in 16 areas related to safety, environment, and quality, based on the UN/ECE initiative. Certain standards are set to be established by 2005, and others are scheduled to come online by 2010.[160]

Labeling

Passenger cars and light trucks are subject to country-of-origin marking rules under the American Automobile Labeling Act (AALA).[161] In July 1994, NHTSA published a final rule establishing new regulations to implement the AALA.[162] However, implementation was delayed until the 1997 model year. These regulations require passenger motor vehicles manufacturers to label their vehicles with domestic and foreign content information. These provisions enable consumers to take country-of-origin information into account in deciding which vehicle to purchase.[163] Each new passenger vehicle is required to be labeled with the following five items of information: (1) the percentage of U.S./Canadian parts content; (2) the names of any countries other than the United States or Canada that individually contribute 15 percent or more of the equipment content, and the percentage content for each country (only the two leading countries are required if more than two countries individually contribute at least 15 percent); (3) the final assembly place by city, state (where appropriate), and country; (4) the country of origin of the engine; and (5) the country of origin of the transmission.[164]

In order to calculate the information required for the label, the vehicle manufacturer must know certain information about the origin of each item of passenger vehicle equipment used to assemble its vehicles. There are different procedures depending on whether equipment is received from an allied supplier (a supplier wholly owned by the manufacturer) or an outside supplier. As originally written, for equipment received from outside suppliers, the equipment is considered U.S./Canadian if it contains at least 70 percent value added in the United States/Canada. Thus, any equipment that is at least 70 percent U.S./Canadian is valued at 100 percent U.S./Canadian, and any equipment under 70 percent is valued at zero percent. For equipment received from allied suppliers, the actual amount of U.S./Canadian content is used.[165]

---

[159] U.S. Department of Transportation, National Highway Traffic Safety Administration, Agency Priorities and Public Participation in the Implementation of the 1998 Agreement on Global Technical Regulations; and Statement of Policy, found at Internet address *http://www.nhtsa.dot.gov/cars/rules/rulings/RIN2127-AH29/RIN2127-AH29.html*, retrieved Aug. 30, 2001.

[160] Toshio Aritake, "Japan: Automobile Lobby Groups Reach Agreement on Establishing Global Standards," *International Trade Daily*, Bureau of National Affairs, June 20, 2000.

[161] P.L. 102-388, Oct. 6, 1992, 106 Stat. 1520, sec. 355; 15 U.S.C.A. 1950.

[162] 49 CFR 583.

[163] 49 CFR 583.2.

[164] 49 CFR 583.5.

[165] 49 CFR 583.6.

The National Highway Traffic Safety Administration Reauthorization Act of 1998 amended the method for determining content from outside suppliers by allowing such equipment with U.S./Canadian content below 70 percent to be valued at the nearest 5 percent rather than zero. Also, the AALA was amended to specify that assembly and labor costs incurred for the final assembly of engines and transmissions are to be included in making these country of origin determinations.[166]

Taxes

Luxury Tax

The luxury tax on automobiles was enacted as part of the Omnibus Budget Reconciliation Act of 1990.[167] When first enacted, the tax was on the first retail sale of vehicles over $30,000 and was equal to 10 percent of the amount by which the vehicle's retail price exceeded $30,000. In the Omnibus Budget Reconciliation Act of 1993,[168] the tax was modified by indexing the $30,000 threshold for inflation occurring after 1990. The tax has been progressively reduced throughout the second half of the 1990s; in August 1996 the rate was reduced from 10 to 9 percent, and it will continue to decrease by 1 percent each year until January 1, 2003, when the tax will expire. As of January 1, 2002, a tax of 3 percent is levied on the amount of the vehicle selling price in excess of $40,000.[169]

Gas Guzzler Tax

The gas guzzler tax was part of the Energy Tax Act of 1978,[170] and is an excise tax on the sale of passenger cars within model types whose fuel economy fails to meet certain fuel economy standards. The tax is imposed on manufacturers. Miles per gallon levels and tax rates were established by year for 1980-85, and 1986 or later. For years 1986 and forward, cars are subject to tax if fuel economy is below 22.5 mpg; the maximum tax is levied if fuel economy is below 12.5 mpg. For years 1986 and forward, the lowest tax was $500, and the maximum was $3,850. In 1990, the Omnibus Budget Reconciliation Act of 1990[171] doubled the gas guzzler taxes in effect since 1986; the current taxes range from $1,000 to $7,700 per car.[172]

---

[166] P.L. 105-178, June 9, 1998, 112 Stat. 107; 49 U.S.C.A. 32304; see also Office of Automotive Affairs, U.S. Department of Commerce, "The American Automobile Labeling Act," found at Internet address *http://www.ita.doc.gov/td/auto/aala.html*.

[167] P.L. 101-508, Nov. 5, 1990, sec. 11216, 104 Stat. 1388; 26 U.S.C.A. sec. 4064.

[168] P.L. 103-66, Aug. 10, 1993, 107 Stat. 312; 26 U.S.C.A. sec. 4001.

[169] 26 U.S.C.A. sec. 1.

[170] P.L. 95-618, Nov. 9, 1978, 92 Stat. 3174, sec. 201; 26 U.S.C.A. sec. 4064.

[171] P.L. 101-508, Nov. 5, 1990, sec. 11216, 104 Stat. 1388; 26 U.S.C.A. sec. 4064.

[172] U.S. Department of Energy and U.S. Environmental Protection Agency, "www.fueleconomy.gov," found at Internet address *http://www.fueleconomy.gov/feg/info.shtml#guzzler*, retrieved Apr. 10, 2002.

The Energy Tax Act requires that the fuel economy of a model type for a model year be determined by the EPA, through a methodology determined by the EPA.[173] Final determination of the gas guzzler tax amount is made by the Internal Revenue Service in consultation with the EPA. The methodology is based on segmenting manufacturer designs into categories – model type,[174] base level,[175] configuration level,[176] and subconfiguration level.[177] According to the law, the EPA specifies the data selection and averaging methods and imposes data requirements on manufacturers that assure that each base level is represented by at least one test from the highest selling configuration. The manufacturer can supplement this with additional data from other vehicles in the base level. Any fuel economy data generated from emissions testing must be included at this time. Design changes that add base levels or change certain parameters automatically require new gas guzzler determinations. If the recalculated fuel economy value changes by 1 mpg or more, the gas guzzler tax is redetermined.[178]

Gas guzzler liability calculations are performed before vehicles are available for sale, so that the tax can be displayed on the fuel economy label at the beginning of the model year.[179] This label notifies the consumer of the fuel economy value and the extra cost at the time of the sale. Thus, the model type calculation must be performed using sales projections. The tax is assessed on each automobile, based on the model type in which it falls.

Extent of Globalization

The motor vehicle industry is characterized by increasing competition, placing ever greater demands on company resources. Firms are under intense pressure to increase quality, efficiency, product diversity, performance, fuel efficiency, and safety. At the same time, firms must carefully control costs. Besides reorganizing corporate structures to remain responsive to competitive demands, firms are increasing their alliances with foreign firms in an effort to pool resources and gain market access. Diverse forms of cooperation have emerged, including joint ventures, equity arrangements, contractual production, major

[173] 26 U.S.C.A. sec. 4064.

[174] "Model type" means a unique combination of car line, basic engine, and transmission class. "Car line" is a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats, or windows, except for station wagons or light-duty trucks, which are considered to be different car lines than passenger cars. See 40 CFR Ch. 1, part 600.002-85.

[175] "Base level" means a unique combination of basic engine inertia weight class and transmission class. A "base vehicle" is lowest priced version of each body style that makes up a car line. See 40 CFR Ch. 1, part 600.002-85.

[176] "Vehicle configuration" means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio within a base level. See 40 CFR Ch. 1, sec. 600.002-85.

[177] "Subconfiguration" means a unique combination, within a vehicle configuration of equivalent test weight, of road-load horsepower and any other operational characteristics or parameters which the administrator determines may significantly affect fuel economy within a vehicle configuration. See 40 CFR Ch. 1, sec. 600.002-85.

[178] 40 CFR Ch 1, sec. 600.

[179] Ibid.

component sourcing, marketing and distribution arrangements, technological agreements, and manufacturing and assembly arrangements.

The U.S. passenger vehicle industry has a presence in nearly every market in the world. The industry sells its vehicles globally, and has extensive linkages with foreign automakers and foreign parts suppliers. GM and Ford have extensive alliances with European, Japanese, and Korean companies, in addition to having assembly plants and licensing arrangements in other regions of the world, such as South America, Africa, and the Middle East. In Europe, GM owns Saab of Sweden, purchasing the remaining 50 percent of the company in 2000. GM has a 20-percent stake in Italy's Fiat, with an option to purchase the remaining 80 percent after January 1, 2004. This arrangement includes joint purchasing and engine supply strategies. GM also has a number of arrangements with Renault of France, including mutual distribution activities in South America, parts supply, marketing agreements, and joint development of light commercial vans. GM has transmission and engine supply arrangements with BMW of Germany, and GM's European Adam Opel subsidiary has a joint-venture agreement with Russia's AvtoVAZ for passenger car production in Russia.[180]

GM has an extensive presence in Asia; the company has a 20-percent stake in Fuji Heavy's Subaru, a 49-percent stake in Isuzu, and a 20-percent stake in Suzuki, all of Japan. These alliances are far-reaching, providing for numerous development, manufacturing, and marketing arrangements around the world.[181] GM also owns 42.1 percent of a new joint-venture company called GM-Daewoo Auto and Technology Co. The original agreement specified that an unnamed GM partner(s) would purchase another 24.9 percent stake, with Daewoo creditors holding 33 percent.[182] Suzuki reportedly will take 15 percent, leaving a 9.9-percent share for another GM partner; some speculate that GM's Chinese partner Shanghai Automotive will also take a stake.[183] GM has a 50-50 joint venture with China's First Auto Works called Jinbei-GM Automotive Co. to produce Chevrolet models, and a joint venture with Shanghai Automotive to produce Buick models. GM also has an engine supply arrangement with Honda, and a 5-year joint research agreement with Toyota regarding advanced propulsion technologies.[184]

In Europe, Ford owns Jaguar, Aston Martin, and Land Rover of the United Kingdom, and Volvo of Sweden. Ford and Fiat are joint partners in Iveco Ford Truck Ltd., which joined the two companies' British truckmaking operations, and Ford and Peugeot (France) are collaborating on engines. Ford used to be a 50-percent partner with Volkswagen in the AutoEuropa assembly plant, which is 100-percent owned by Volkswagen. The plant continues to produce vehicles for Ford. Volkswagen also supplies engines to Volvo, and Volvo has a mutual engine and parts supply arrangement with Renault.[185]

---

[180] Ward's Automotive International, *Interrelationships Among the World's Major Automakers 2001* (Southfield, MI: Ward's Communications, 2001).

[181] Ibid.

[182] Just-auto.com editorial team, "Despite protesters, GM, Daewoo and creditors finally sign deal," Apr. 30, 2002, found at Internet address *http://www.just-auto.com*, retrieved Apr. 30, 2002.

[183] Kim Willenson, "Suzuki Reported Planning To Take 15% of New Daewoo To Work on Subcompacts," *The Japan Automotive Digest*, vol. VIII, No. 23, June 24, 2002, p. 5.

[184] Ward's Automotive International, *Interrelationships Among the World's Major Automakers 2001*.

[185] Ibid.

Like GM, Ford also has extensive ties in Asia. Ford owns 33.4 percent of Mazda of Japan. The two companies have a far-reaching relationship, providing for numerous development, manufacturing, and marketing arrangements around the world. Ford and Mazda have collaborated extensively in the United States at their joint venture, AutoAlliance, as well as in Europe, Asia, and Latin America. The two automakers share platforms and parts, and are to fully integrate their product releases and parts procurement by 2002. Ford also has two separate 50-50 joint ventures in China with Chongqing Chang'an Automotive Co. and Yuejin Motors to build passenger vehicles, as well as a 70-percent stake in Taiwan's Lio Ho. Ford's Volvo has a 50-percent stake in the NedCar venture with Mitsubishi; Volvo will be exiting the venture shortly. Volvo and Mitsubishi also collaborate on engines.[186]

Globalization and consolidation are also evident in the competitive commercial truck and bus industry. This industry is characterized by high capital costs, relatively low production volumes, and the need to reduce cost bases and achieve economies of scale.[187] Access to engine and major component supply and technology are also driving mergers, acquisitions, and other relationships.[188] European truckmakers are the most globalized, while Japanese truckmakers are generally small and focused on the Asia market. Similarly, U.S. truckmakers tend to focus on the relatively large North American market.[189] Despite the fact that government standards and market preferences vary around the world, transnational equity partners are attempting to standardize production, to the extent possible, as common platforms allow for larger volume components purchases.[190]

Recent tie-ups among bus and truckmakers include:

- Paccar's (United States) purchase of DAF (Netherlands) in 1996 and Leyland (United Kingdom) in 1998; the company has owned Foden (United Kingdom) since 1980.
- Volvo's (Sweden) acquisition of Mexicana de Autobuses in 1998.
- The purchase of U.S. school bus maker Blue Bird by British busmaker Henlys in 1999.
- Volkswagen (Germany) becoming Scania's (Sweden) main owner with a 34-percent voting share in early 2000 after Volvo lost a bid to up its stake to full ownership (Volvo has 30.6-percent voting share).
- Volvo's acquisition of Renault V.I. (France) through an equity swap in May 2000 that gave Renault 15 percent of Volvo, which it later upped to 20 percent. Renault also owns U.S.-based Mack Trucks, and has a 22.5-percent stake in Nissan Diesel.
- Freightliner's (DaimlerChrysler's commercial truck unit) purchase of Western Star (Canada) in 2000. In this deal, Freightliner also got Orion Bus Industries, making DaimlerChrysler the only complete bus product line manufacturer in North America, also owning Thomas Built Buses since 1998.

[186] Ibid.
[187] The Economist Intelligence Unit, "The World Heavy Truck Industry: Structural Change Ahead."
[188] Ibid.
[189] Enders, "Challenges in the Global Truck Market," pp. 37-38.
[190] The Economist Intelligence Unit, "The World Heavy Truck Industry: Structural Change Ahead."

- The extension of DaimlerChrysler's tie-up with Hyundai (Korea) to commercial vehicles in 2000.
- DaimlerChrysler's acquisition of a 34-percent stake in Mitsubishi in 2000, followed by its purchase of Volvo's 3.3-percent stake in Mitsubishi Fuso (the company's commercial truck unit) in 2001.
- The creation by Ford and Navistar of a 50/50 joint venture in 2001 called Blue Diamond Truck Co. that will manufacture medium-duty trucks in Mexico.

U.S. MARKET

Consumer Characteristics and Factors Affecting Demand

Consumers of motor vehicles are individuals, businesses, and governments. Sales of passenger vehicles to individual consumers and businesses account for most sales and are roughly equal. Sales to federal, state, and local governments account for a very small percentage of total U.S. car sales (table 2). Sales of commercial vehicles are primarily to businesses (e.g., privately-owned trucking companies and bus transportation providers), and governments (e.g., urban transit operators).

Table 2
U.S. car sales by sector, by percent, 1997-2001

Year	Consumer	Business	Government
2001	55.3	42.7	2.0
2000	53.0	45.1	1.9
1999	50.2	47.8	2.0
1998	49.0	49.0	2.0
1997	47.3	51.0	1.7

Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Trends in motor vehicle sales in the United States are dominated by cyclical macroeconomic trends in the U.S. economy. Typically, sales downturns of several years follow several years of sales growth. Passenger vehicle sales are highly representative of the health of the U.S. economy and are considered to be an important leading economic indicator. According to one auto industry expert, there are four key pillars upon which new passenger vehicle sales rely: personal income growth, unemployment levels, consumer confidence, and the value of used cars.[191]

[191] Reuters, "U.S. auto market faces many plant closures," Oct. 23, 2001, found at Internet address *http://www.just-auto.com*, retrieved Oct. 23, 2001.

The length of time that automakers can expect their products to be competitive in the market is decreasing due to competitive pressure from Asian automakers that significantly redesign their models every 4 to 5 years, typically a faster cycle than U.S. automakers.[192] Demand for particular vehicles is influenced by factors such as safety, price, styling, performance, quality, and image. Although these consumer attitudes are most pronounced in the passenger vehicle market, the commercial vehicle market faces these consumer attitudes to varying degrees as well.

Commercial vehicle sales are influenced by a number of factors, including growth or contraction in the general economy, interest rates, fuel prices, the age of the fleet, availability of used vehicles, and changes in regulations. Market factors such as the rise in online shopping, which may increase the demand for medium-duty trucks, and tourism booms, which might spur demand for motor coach-type buses, also influence sales. Purchases of commercial vehicles are scrutinized as business investments, with a prospective buyer considering how the vehicle would meet its transport needs, the price of the vehicle, and the lifecycle cost of the vehicle.[193] Commercial vehicles must meet a very high quality and reliability standard so that costly downtime is minimized and maintenance costs are as low as possible.[194]

The Effects of September 11 on the U.S. Automotive Industry

The combination of a slowdown in the world economy and the events of September 11 and its aftermath have affected the U.S. and global automotive industries. In the months leading up to September 11, the Big Three had experienced declines in sales and market share. Immediate effects of September 11 included plant closings that resulted in an estimated 52,636 units of lost production in the first week after the attack; up to 36-hour delays in auto parts deliveries at the Canadian border closest to Detroit due to heightened security measures;[195] a several-day delay in air-freight deliveries of auto parts;[196] a sales downturn of 35 percent in the days after the attack;[197] and over 20-percent declines in the share prices of most automotive stocks.[198] However, low and no interest financing offered by U.S. and some foreign-based automakers boosted sales in the final quarter of 2001, with the result that overall sales for the year 2001 exceeded the level of 1999 but were below the 2000 level.

---

[192] Office of Automotive Affairs, "Motor Vehicles," p. 36-3.

[193] Enders, "Challenges in the Global Truck Market," p. 42.

[194] Ibid.

[195] "Terror Attacks Stall Industry; Long-term Impact Unknown," *Ward's Auto World*, Oct. 2001, p. 25.

[196] Lindsay Chappell, "At half-staff: Grief and uncertainty seize industry, nation," *Automotive News*, Sept. 17, 2001, p. 1.

[197] According to JD Power. Just-auto.com editorial team, "Automakers, Feds gather for summit," Sept. 21, 2001, found at Internet address *http://www.just-auto.com*, retrieved Sept. 21, 2001.

[198] Harry Stoffer, "Falling stock, empty showrooms tell of dark days," *Automotive News*, Sept. 24, 2001, p. 4.

Consumption

As noted, short- and medium-term consumption trends in the U.S. motor vehicle industry tend to mirror the growth and decline of the U.S. economy. U.S. sales of motor vehicles increased steadily from 15.5 million units in 1997 to 17.8 million in 2000, before declining slightly in 2001 to 17.5 million (table 3). In the United States and other developed markets, the level of motor vehicle ownership is high, leaving limited opportunity for substantial sales growth. In addition, vehicle durability is increasing, requiring that vehicles be replaced less often than in the past. These facts notwithstanding, the U.S. market for passenger vehicles has been quite robust during the last several years. One factor supporting healthy sales is the high incidence of expired leases; almost twice the number of vehicle leases expire annually today as compared to the mid-1990s, requiring new leases or purchases. In addition, today, passenger vehicle purchases require fewer weeks of the median family income owing to discounts in new vehicle prices as well as soaring household incomes.[199]

Table 3
U.S. motor vehicle unit sales, by type of vehicle,[1] 1997-2001

	1997	1998	1999	2000	2001
Cars	8,272,074	8,141,721	8,698,284	8,846,625	8,422,625
Light trucks	6,849,647	7,401,286	8,195,254	8,503,130	8,699,744
Medium/heavy-duty trucks	376,139	424,280	521,534	461,918	350,009
Total	15,497,860	15,967,287	17,415,072	17,811,673	17,472,378

[1] Comprehensive data on sales of buses are not available.

Source: Ward's Communications.

Within the passenger vehicle sector, light trucks have become an increasingly important product subsector in terms of sales. During 1997-2001, passenger car sales increased by an annual average of less than 1 percent; sales of light trucks registered an average annual increase of 6 percent. Although the most recent sales record for passenger car sales was set in 1986, light trucks have set consecutive new sales records every year since 1992.[200] The Big Three benefitted from first-mover advantage in the light truck sector, but the increased incursion of Japanese nameplates indicates that the Big Three's market domination will be challenged in the near future as Japanese automakers increase their truck-making capacity in North America and introduce new models. In 1996, Japanese nameplates from all sources accounted for 13 percent of the light truck market in the United States; by 2001, their share was up to 20 percent.[201]

[199] Donna Harris, "Surprisingly high sales? It's normal," *Automotive News*, June 3, 2002, p. 1.
[200] *2001 Ward's Motor Vehicle Facts and Figures* (Southfield, MI: Ward's Communications, 2001), pp. 26-27.
[201] Lindsay Chappell, "Expect more Japanese trucks," *Automotive News*, Apr. 1, 2002, p. 1.

As noted earlier in this report, sales of commercial vehicles – i.e., medium- and heavy-duty trucks and buses – account for a much smaller percentage of U.S. retail sales. Within the commercial truck sector, medium-duty trucks and heavy-duty trucks have followed the same trend, increasing to a peak in 1999 and declining thereafter (table 4). Sales of class 8, or heavy-duty trucks, are more erratic, experiencing bigger shifts each year and culminating in a 34-percent drop in 2001.

Table 4
U.S. commercial truck unit sales, by class of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Class 4	56,526	44,090	49,423	47,417	52,037
Class 5	9,262	25,173	30,353	29,125	24,362
Class 6	18,111	32,086	48,135	51,209	42,435
Class 7	113,689	117,128	130,983	122,614	91,650
Total medium-duty	197,588	218,477	258,894	250,365	210,484
Class 8 (heavy-duty)	178,551	209,482	262,415	211,507	139,614
Total medium- and heavy-duty	376,139	427,959	521,309	461,872	350,098

Source: Ward's Communications, as printed in *Automotive News*, various issues.

The U.S. market is the largest in the world and is generally considered to be among the most open markets to imports. As expected, import consumption is high. During 1997-2001, sales of imports as a percentage of total motor vehicle unit sales increased each year, from 13 percent of retail sales in 1997 to 18 percent in 2001.[202] Canada is the leading source of U.S. motor vehicle imports; however, subsidiaries of U.S. automakers account for most of these imports. Therefore, imports from Japan, the second-leading import source, exert the greatest competitive pressure on U.S. automakers. U.S. imports from Japan accounted for approximately 10 percent of U.S. passenger car sales in 2001, and 9 percent of U.S. light truck sales.[203] However, Japanese automakers rely heavily on their U.S. assembly plants to serve the U.S. market, and Japanese nameplate vehicles, regardless of place of assembly, accounted for 27 percent of U.S. passenger vehicle sales in 2001 (table 5).[204]

---

[202] *2001 Ward's Motor Vehicle Facts and Figures*, p. 15; and data supplied by Ward's Communications, Apr. 12, 2002.
[203] Data supplied by Ward's Communications, Apr. 12, 2002.
[204] *Ward's Automotive Reports*, vol. 77, No. 1, Jan. 7, 2002, insert p. 1.

Production

The U.S. industry manufactures motor vehicles around the world and does not rely heavily on domestic exports to serve overseas markets. Therefore, U.S. production depends primarily on U.S., and to a lesser extent, Canadian demand for U.S.-built motor vehicles. U.S. motor vehicle production decreased from 12.1 million units in 1997 to 11.4 million units in 2001 (table 6), while sales of motor vehicles increased during the period, indicating that imports have gained market share. The relatively low level of U.S. motor vehicle exports provides no substantial outlet for U.S. production during domestic market downturns.

Table 5
U.S. car and light truck unit sales, by manufacturer, 1997-2001

	1997	1998	1999	2000	2001
Big 3:					
GM (Buick/Cadillac/Chevrolet/Hummer/ Oldsmobile/Pontiac/GMC/Saturn/Saab)	4,732,002	4,569,384	4,974,572	4,911,673	4,852,552
Ford (Ford/Lincoln/Mercury/Jaguar/ Land Rover[1]/Volvo[2])	3,800,228	3,960,449	4,115,603	4,147,734	3,915,458
DaimlerChrysler (Chrysler/Plymouth/Jeep/Eagle/Dodge)	2,303,788	2,510,011	2,638,561	2,522,695	2,273,208
Total Big 3	10,836,018	11,039,844	11,728,736	11,582,102	11,041,218
Japanese brands:					
Honda/Acura	940,386	1,009,600	1,076,893	1,158,860	1,207,639
Isuzu	97,795	108,478	111,319	104,485	84,083
Mazda	221,840	240,546	243,708	255,526	269,602
Mitsubishi	190,978	192,785	263,418	316,496	323,686
Nissan/Infiniti	728,377	621,601	677,890	752,786	703,659
Subaru	133,783	147,833	156,806	172,218	185,944
Suzuki	29,273	37,608	49,609	60,845	64,698
Toyota/Lexus	1,230,112	1,361,025	1,475,441	1,619,206	1,741,254
Total Japanese brands	3,572,544	3,719,476	4,055,084	4,440,422	4,580,565
Korean brands:					
Hyundai	113,186	90,217	164,190	244,391	346,235
Kia	55,325	82,893	134,594	160,606	223,721
Daewoo	0	2,242	30,787	68,360	48,296
Total Korean brands	168,511	175,352	329,571	473,357	618,252
European brands:					
BMW[1]	122,500	152,981	184,350	189,423	213,127
Land Rover[1]	23,825	0	0	0	0
Mercedes	122,408	170,915	190,388	206,190	206,719
Porsche	12,976	17,243	20,884	22,410	23,041
Volvo[2]	90,894	0	0	0	0
VW/Audi	172,045	267,196	381,522	435,851	438,931
Total European brands	544,648	608,335	777,144	853,874	881,818
Total	15,121,721	15,543,007	16,890,535	17,349,755	17,121,853

[1] Land Rover is counted as part of BMW Group for 1998-99, and as a stand-alone brand for 1997.
[2] Volvo is not counted as part of Ford Group for 1997.

Note.--Data may not reconcile with table 3, as data from that source may have been revised.

Source: *Ward's Automotive Reports*, vol. 77, No. 1, Jan. 7, 2002, insert p. 1; *Ward's Automotive Reports*, vol. 75, No. 2, Jan. 10, 2000, insert p. 1; and *Ward's Automotive Reports*, vol. 74. No. 2, Jan. 11, 1998, insert p. 1.

Table 6
U.S. motor vehicle unit production, by type of vehicle,[1] 1997-2001

	1997	1998	1999	2000	2001
Cars	5,933,921	5,554,373	5,637,949	5,542,217	4,879,119
Light trucks	5,858,937	6,073,948	6,955,161	6,840,099	6,292,779
Medium/heavy-duty trucks	337,716	374,342	428,140	391,398	252,791
Total	12,130,574	12,002,663	13,021,250	12,773,714	11,424,689

[1] Comprehensive data on production of buses are not available.

Source: Ward's Communications.

U.S. passenger vehicle production by GM, Ford, and Chrysler fluctuated during 1997-2001, following the same pattern as total U.S. passenger vehicle production (table 7). Production by the Big Three registered an average annual percentage decrease of 2.4 percent, and total U.S. production registered an average annual percentage decrease of 1.3 percent. Production by Japanese affiliates rose during the period, except for a slight decrease in 2001, with an average annual percentage increase of 1.4 percent. Production by German affiliates rose sharply during the period (with the exception of a slight dip in 1999), registering an average annual percentage increase of 24.6 percent. German automakers BMW and Mercedes-Benz began producing SUV models during the period with significant increases in production rates thereafter; BMW began producing its X5 in 1999 and Mercedes-Benz began producing the M Class in 1997.

Table 7
U.S. passenger vehicle unit production, by car and light truck, 1997-2001

	1997	1998	1999	2000	2001
Big 3[1]:					
Car	4,037,082	3,736,573	3,915,432	3,776,728	3,155,904
Light truck	5,460,455	5,552,481	6,284,952	5,987,018	5,445,912
Total Big 3	9,497,537	9,289,054	10,200,384	9,763,746	8,601,816
Japanese affiliates:					
Car	1,833,896	1,762,998	1,674,123	1,726,824	1,689,046
Light truck	378,277	451,941	589,290	727,483	678,935
Total Japanese affiliates	2,212,173	2,214,939	2,263,413	2,454,307	2,367,981
German affiliates:					
Car	62,943	54,802	48,394	38,665	34,169
Light truck	20,205	69,526	80,919	125,598	167,932
Total German affiliates	83,148	124,328	129,313	164,263	202,101
Total:					
Car	5,933,921	5,554,373	5,637,949	5,542,217	4,879,119
Light truck	5,858,937	6,073,948	6,955,161	6,840,099	6,292,779
Total	11,792,858	11,628,321	12,593,110	12,382,316	11,171,898

[1] General Motors, Ford, and the Chrysler Group of DaimlerChrysler.

Source: Ward's Communications.

During the period, the share of U.S. production held by GM, Ford, and Chrysler fell. In 1997, the Big Three accounted for nearly 80 percent of total production, with Japanese affiliates accounting for nearly 20 percent and German affiliates accounting for less than 1 percent. In 2001, those percentages were 76 percent, 22 percent, and 2 percent, respectively, reflecting the increased capacity installed in the United States by Japanese and German automakers.

U.S. TRADE

Overview

The United States consistently runs a deficit in motor vehicle trade. The persistent trade deficit can be attributed to several factors, including the decision of GM and Ford to produce in foreign markets instead of relying on exports from the United States; the increasing integration and rationalization of automotive production in the NAFTA region; and the popularity of foreign models that are produced overseas, or the U.S. production of which is supplemented by imports.

The U.S. deficit in motor vehicles trade increased by over 50 percent during 1997-2001 (table 8). The deficit with all leading trading partners of the United States increased during the period, including Canada (31 percent), Japan (23 percent), Mexico (71 percent), Germany (62 percent), and Korea (248 percent).

Table 8
U.S. motor vehicle merchandise trade balance based on imports for consumption and domestic exports, in millions of dollars, by selected countries, 1997-2001

Country	1997	1998	1999	2000	2001
Japan	-26,347	-27,745	-31,308	-33,735	-32,460
Canada	-21,682	-24,301	-32,138	-31,171	-28,315
Mexico	-10,340	-10,976	-13,537	-17,818	-17,717
Germany	-8,669	-11,322	-14,019	-14,241	-14,080
Korea	-1,822	-1,685	-2,870	-4,765	-6,335
United Kingdom	-1,355	-1,398	-1,843	-2,481	-2,199
Sweden	-1,808	-1,977	-2,064	-2,147	-2,167
Belgium	-518	-910	-895	-892	-1,002
Austria	8	12	17	-26	-608
Brazil	239	86	20	-129	-601
All Other	3,683	2,910	1,022	677	865
Total	-68,612	-77,305	-97,614	-106,727	-104,619

Source: Compiled from official statistics of the U.S. Department of Commerce.

U.S. Imports

Principal Suppliers and Import Levels

Canada has traditionally been the leading import supplier of motor vehicles to the United States, owing to the high degree of integration between the U.S. and Canadian auto industries (table 9). Japan, Mexico, and Germany were the second-, third-, and fourth-leading sources of U.S. imports throughout the period, respectively. Although imports from all leading sources increased during 1997-2001, owing to a strong motor vehicle market in the United States as well as sustained popularity of import models, such imports tended to slow or decrease slightly in 2000 and 2001. Imports from Korea, however, have increased sharply, particularly since 1999, and increased at an average annual percentage of 35.3 percent during 1997-2001.

Table 9
U.S. motor vehicle imports for consumption, in millions of dollars, by selected countries, 1997-2001

Country	1997	1998	1999	2000	2001
Canada	35,883	37,670	46,563	45,656	41,150
Japan	27,906	28,864	32,115	34,507	33,019
Mexico	12,270	13,225	15,813	21,025	21,327
Germany	9,761	12,484	15,094	15,373	15,852
Korea	1,900	1,691	2,886	4,792	6,369
United Kingdom	1,668	1,836	2,356	2,804	2,728
Sweden	1,859	2,011	2,106	2,189	2,191
Belgium	1,215	1,469	1,469	1,076	1,220
Austria	4	6	4	59	655
Brazil	11	3	3	167	625
All Other	508	567	1,255	1,904	2,107
Total	92,984	99,826	119,663	129,553	127,244

Source: Compiled from official statistics of the U.S. Department of Commerce.

U.S. Trade Measures

Tariff Measures

U.S. normal trade relations (general) tariffs on most motor vehicles are quite low, at 2 percent ad valorem for buses, 2.5 percent on passenger vehicles and their bodies and chassis, and 4 percent on road tractors for semi-trailers and on bus and truck bodies and chassis. However, general and column 2 tariffs on trucks, including pickup trucks, are 25 percent. This unusually high tariff has been in place for nearly four decades, having been imposed in 1963 in retaliation against West German barriers to U.S. poultry exports.[205]

There are a variety of special tariff treatment programs in effect for motor vehicles (see appendix A); most of them eliminate the duty on qualifying products, while some reduce the column 1 general rate of duty. These programs include the Generalized System of Preferences; Automotive Trade Products Act; North American Free Trade Agreement, Goods of Canada and Goods of Mexico; African Growth and Opportunity Act; Caribbean Basin Economic Recovery Act; United States-Israel Free Trade Area; Andean Trade Preference Act; and the United States-Jordan Free Trade Area Implementation Act.

Nontariff Measures

There are a number of current U.S. policies that foreign competitors view as barriers to imports. For example, the European Union cites the luxury tax, gas guzzler tax, Corporate Average Fuel Economy requirement, and the American Automobile Labeling Act as barriers to imported passenger vehicles (see section on Regulatory Issues).[206]

U.S. Government Trade-Related Investigations

Japan

On May 16, 1995, the Office of the United States Trade Representative (USTR) announced that, pursuant to sections 301 and 304 of the Trade Act of 1974, the United States would impose tariffs of 100 percent on U.S. imports of luxury cars from Japan.[207] The announcement came after USTR determined that Japan had specific barriers to access to the aftermarket for auto parts in Japan. Extensive consultations between the United States and

---

[205] This was known as "the chicken war" with Europe. Proclamation No. 3564, 28 Fed. Reg. 13247, Dec. 6, 1963.

[206] *2000 Report on United States Barriers to Trade and Investment*, European Commission, Brussels, July 2000, found at Internet address *http://europa.eu.int/comm/trade/pdf/usrbt2000.pdf*, retrieved Feb. 12, 2002.

[207] "Notice of Determination and Request for Public Comment Concerning Proposed Determination of Action Pursuant to Section 301: Barriers to Access to the Auto Parts Replacement Market in Japan," *Federal Register*, May 18, 1995, pp. 26745-26746.

Japan eventually culminated in the signing of the U.S.-Japan Agreement on Autos and Auto Parts (Agreement) on June 28, 1995, with an expiration date of December 31, 2000.

As part of the Agreement, the Government of Japan made commitments in three areas: improving market access for foreign motor vehicles; eliminating regulations that limit U.S. auto parts sales in Japan; and enhancing sales opportunities for U.S. original equipment parts producers with Japanese automakers in the United States and Japan.[208] Consultative meetings were held periodically, and at the April 2000 meeting, the U.S. and Japanese Governments discussed the future of the soon-to-expire Agreement; the Japanese Government highlighted the globalization of the automotive industry and issues other than market access that will determine the success of the automotive industry in Japan. U.S. auto parts interests supported a follow-on agreement, while automakers expressed an interest in a government-to-government consultative framework.[209]

The Governments of the United States and Japan met on November 28-29, 2000. Although acknowledging some progress over the life of the Agreement, the United States expressed concern that the overall market access objectives of the Agreement were not met, noting decreases in U.S. exports of vehicles and parts to Japan. The United States stated that, the weak Japanese economy notwithstanding, more could be done to improve access and competition in the Japanese market.[210] The Agreement expired without a continuance or replacement at the end of 2000.

It was reported in early September 2001 that high-level Japanese and U.S. trade officials had agreed to start a new round of automotive trade talks, but these were stalled as a result of the terrorist attacks on the United States on September 11, 2001.[211] On October 18, 2001, the Governments of Japan and the United States announced that they would form a bilateral Automotive Consultative Group that would meet annually. Reportedly, the Japanese would like the Group to look at forward-looking global issues,[212] while USTR stated that the group will "assess trends in the industry" based on U.S. and Japanese trade and economic data, as well as addressing "market access issues as well as needed regulatory reform in Japan."[213]

---

[208] The Agreement includes 15 quantitative and qualitative criteria specific to motor vehicles, original equipment parts, and aftermarket parts, as well as two general qualitative criteria, all of which are designed to measure progress in reaching joint goals in these sectors.

[209] "U.S., Japan Informally Explore Future After Expiry of Auto Deal," Apr. 28, 2000, found at Internet address *http://www.insidetrade.com*, retrieved Apr. 28, 2000.

[210] Office of the United States Trade Representative press release, "U.S. and Japan Complete Annual Review of Automotive Framework Agreement, U.S. Emphasizes Need for Improved Market Access and Competition in Japan," Nov. 29, 2000.

[211] Just-auto editorial team, "New round of U.S.-Japan auto talks agreed," Sept. 3, 2001, found at Internet address *http://www.just-auto.com*, retrieved Sept. 10, 2001.

[212] Chris Rugaber and Toshio Aritake, "U.S., Japan Agree To Form Auto Group To Replace Old Economic Framework Pact," *International Trade Daily*, Bureau of National Affairs, No. 202, Oct. 19, 2001.

[213] Office of the United States Trade Representative press release, "U.S. and Japan Launch New Forum To Address Bilateral Automotive Issues," Oct. 18, 2001, found at Internet address *http://www.ustr.gov/releases/2001/10/01-85.htm*, retrieved June 27, 2002.

Korea

In September 1995, the United States and Korea signed a Memorandum of Understanding (MOU) that aimed to address trade-distorting practices impeding access to the Korean motor vehicle market. While the fourth-largest motor vehicle producer in the world and the fifth-largest market, imports account for less than 1 percent of the Korean motor vehicle market. Dissatisfied with the progress made in implementing the 1995 MOU, the United States engaged Korea in a series of negotiations during mid-1997, seeking more meaningful actions on Korean tariffs, taxes, and standards.[214] Because the United States did not view the outcome of these negotiations as satisfactory, USTR initiated a section 301 investigation in October 1997, and Korea's market access barriers were cited as a priority foreign country practice under Super 301 procedures.[215] In October 1998, an agreement was reached that ended the section 301 investigation against Korea, averting trade sanctions. The 1998 agreement was expected to "eliminate or streamline onerous standards and certification requirements, substantially reduce the tariff and tax burden on foreign motor vehicles, introduce a new, comprehensive secured financing mechanism to facilitate sales, and provide effective redress to any anti-import activity."[216] However, the U.S. industry continues to cite Korean practices as severely hampering the sale of imported motor vehicles.[217]

U.S. Exports

Principal Markets and Export Levels

The low level of U.S. exports relative to production is largely explained by an extensive U.S. manufacturing and market presence in foreign countries. For example, in 2001 Ford accounted for 11 percent (fourth place) and GM 10 percent (sixth place) of the West European market,[218] and Ford and GM were the region's second- and fourth-largest assemblers, respectively, in 2000.[219] U.S. auto companies also have production facilities in Latin America, Asia, and Africa.

There are several reasons this strong international presence has developed. Many foreign markets have significant trade barriers, including high tariffs as well as nontariff barriers

[214] Office of the United States Trade Representative press release, "U.S. Gains Major Improvements in Access to Korean Motor Vehicle Market," Oct. 20, 1998, found at Internet address *http://www.ita.doc.gov/td/auto/koreapress1098.html*, retrieved Apr. 30, 2002.

[215] Office of the United States Trade Representative, *1998 National Trade Estimate Report on Foreign Trade Barriers*, found at Internet address *http://www.ustr.gov/pdf/1998_korea.pdf*, retrieved June 4, 2002.

[216] Office of the United States Trade Representative press release, "U.S. Gains Major Improvements in Access to Korean Motor Vehicle Market."

[217] Statement of Stephen Collins, President, Automotive Trade Policy Council, U.S. International Trade Commission public hearing in connection with inv. No. 332-425, *U.S.-Korea FTA: The Economic Impact of Establishing a Free Trade Agreement (FTA) Between the United States and The Republic of Korea*, USITC publication 3425, Sept. 2001.

[218] *Ward's Automotive Reports*, vol. 77, No. 2, Jan. 14, 2002, insert p. 6.

[219] *Ward's World Motor Vehicle Data 2001* (Southfield, MI: Ward's Communications, 2001), p. 212.

such as domestic content requirements and investment requirements.[220] Lower wage rates in many countries are also an incentive for automakers to produce in foreign markets. Finally, automakers are better able to respond to consumer preferences by establishing local production, engineering, marketing, research, and management operations. As with imports, Canada, Japan, Mexico, and Germany are the four leading trading partners in terms of U.S. exports, although not in the same order (table 10). Owing to the integration of the North American market, Canada and Mexico are the leading markets for U.S. vehicle exports. The integration of the U.S. and Canadian automotive industries, spurred decades ago by the Automotive Products Trade Act of 1965, has resulted in significant production rationalization,[221] intra-industry trade, and trade in intermediate goods. Production-sharing arrangements encouraged similar regional integration with Mexico. Prior to NAFTA, which was implemented on January 1, 1994, Mexican import restrictions led U.S. automakers and parts producers to maintain production in Mexico that was redundant with production elsewhere in North America. However, the gradual removal of Mexican import barriers under NAFTA has prompted the U.S. automotive industry to rationalize production by exporting to Mexico those vehicles and parts that are more efficiently produced in the United States or Canada.[222]

Table 10
U.S. motor vehicle domestic exports, in millions of dollars, by selected countries, 1997-2001

Country	1997	1998	1999	2000	2001
Canada	14,201	13,369	14,425	14,485	12,834
Mexico	1,929	2,248	2,277	3,207	3,610
Germany	1,092	1,163	1,075	1,133	1,772
Japan	1,558	1,118	807	772	559
United Kingdom	313	439	513	322	530
Belgium	697	560	574	184	217
Austria	12	18	22	34	47
Korea	78	7	16	27	35
Sweden	51	35	42	42	24
Brazil	250	89	23	38	24
All Other	4,191	3,477	2,277	2,582	2,972
Total	24,372	22,522	22,049	22,827	22,625

Source: Compiled from official statistics of the U.S. Department of Commerce.

[220] For more information on nontariff barriers, see Office of Automotive Affairs, U.S. Department of Commerce, "World Motor Vehicle Import Requirements," Aug. 2001, found at Internet address *http://www.ita,doc.gov/td/auto/impreq.html*.

[221] Rationalization refers to a strategy whereby vehicle models are produced in a single or reduced number of locations, where models are most efficiently produced, for distribution throughout a wide region.

[222] For more information, see John Mutti, *NAFTA: The Economic Consequences for Mexico and the United States* (Washington, DC: Economic Strategy Institute, 2001); and USITC, *Production-Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations*, 1995-1998, inv. No. 332-237, USITC publication 3265, Dec. 1999.

U.S. exports to Japan have declined steadily throughout the period, and have been a source of trade friction between the two countries (see section on U.S. Government trade-related investigations). U.S. exports to Germany have increased during 1997-2001, largely owing to shipments of Mercedes-Benz and BMW SUV models that are produced only in the United States.[223]

Foreign Trade Measures

Tariff Measures

Foreign tariffs faced by U.S. exports vary by market. Developed markets tend to have low or no tariffs on motor vehicle imports, while countries with fledgling motor vehicle industries tend to maintain high tariffs as a form of protection. U.S. motor vehicle exports to the leading three markets – Canada, Japan, and Mexico – are free of duty. U.S. exports to Canada and Japan were free of duty throughout 1997-2001.[224] Mexican tariffs on U.S. passenger cars and commercial vehicles meeting the NAFTA rule of origin were phased down during the period under the provisions of NAFTA, reaching 2.2 percent for passenger cars and 4 percent for commercial vehicles in 2001; the tariff on most light trucks was zero at the start of NAFTA, while the remaining tariff on certain light trucks meeting the rule of origin was eliminated on January 1, 1998.[225] Other important markets include Germany and United Kingdom, which impose a common European external tariff of 10 percent ad valorem on passenger cars, 12.5 percent on electric cars, and 11 and 22 percent on diesel- and gas-engined trucks, depending on engine size.[226] Korea maintains an 8-percent tariff on passenger vehicles and a 10-percent tariff on commercial vehicles.[227]

Nontariff Measures

U.S. motor vehicle exports face a variety of nontariff measures in overseas markets. Taxes based on engine size are imposed in numerous countries, including Korea. Although these taxes are generally applied to both domestically produced and imported vehicles, they are perceived as a barrier to U.S. exports which tend to be comparatively larger cars with bigger engines. Taxes are also assessed, in some cases, based on local content.

Some countries require foreign automakers to obtain a license to import motor vehicles. Obtaining such a license may be contingent on a number of requirements such as local content requirements, foreign exchange balancing requirements (requirements concerning

---

[223] BMW also produces the Z3 roadster/coupe (to be replaced by the Z4 in autumn 2002) exclusively in the United States.

[224] Japan does not maintain a tariff on imports of motor vehicles from any source, and the Canadian tariff on nonNAFTA-qualifying vehicles is 6.1 percent.

[225] The Mexican tariff on nonNAFTA-qualifying vehicles is 20 percent; a tariff of 10 percent is levied on certain trucks.

[226] Diesel and semi-diesel trucks 2.5 liters and below are assessed 11 percent, and those above 2.5 liters are assessed 22 percent. The dividing size for gasoline-powered trucks is 2.8 liters.

[227] Office of Automotive Affairs, "World Motor Vehicle Import Requirements."

the value of imports and exports), local ownership requirements in the case of domestic manufacturing facilities producing foreign nameplate vehicles, and equity requirements in joint venture operations.[228]

Some countries maintain bans on the import of motor vehicles from certain countries (e.g., until recently, Korea banned vehicles from Japan), maintain procurement policies that favor local manufacturers, or maintain quotas on vehicle imports. In addition, certain foreign countries do not have automobile purchase financing available and do not allow foreign automakers to offer financing for the purchase of motor vehicles.[229]

FOREIGN INDUSTRY PROFILE

The global motor vehicle industry is relatively concentrated, with the leading 10 automakers in the world accounting for 77 percent of total world output.[230] The Japanese industry, which was the world's largest motor vehicle producer during the 1980s and early 1990s, is by far the most important competitor of the United States. EU producers have a combined output that exceeds that of Japan and the United States, but no single EU country rivals Japanese or U.S. production.[231] Korea has a substantial, export-oriented motor vehicle industry that has experienced both growth and restructuring in recent years. Although Canada is a major producer, it is generally not viewed as a competitor to the U.S. industry because the Canadian industry is largely dominated by subsidiaries of U.S. companies. The small but rapidly expanding industry in Mexico is also highly integrated with the U.S. industry, although the strong presence of Volkswagen and Nissan, as well as the recent arrival of other foreign companies, make it more of a potential competitor to the U.S. industry.

European Union[232]

As a region, the EU is the leading motor vehicle producer in the world; production levels approximate those of the NAFTA region (United States, Canada, and Mexico). In terms of market size, the EU and the United States alternate as the global leader in annual motor vehicle sales. The economic importance of the motor vehicle industry in the EU varies by country; for Sweden, Germany, France, and Spain, motor vehicle production accounts for approximately 10 percent of total manufacturing, while the average for the EU is around 8 percent.[233] Within the EU, the largest producer is Germany (roughly 30 percent of EU production), followed by France (19 percent), Spain (17 percent), United Kingdom (10

[228] Ibid.
[229] Ibid.
[230] *Ward's Motor Vehicle Facts and Figures 2001*, p. 13.
[231] Automotive News, *2002 Market Data Book* (Detroit, MI: Crain Communications, 2002), pp. 8-9.
[232] Unless otherwise noted, EU refers to the EU-15 countries, which are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
[233] Eurostat, *Panorama of European Business, 1999* (Luxembourg: European Commission, 2000), p. 355.

percent), and Italy (10 percent). These five countries are also the largest motor vehicle markets in the region.

There are over 20 passenger vehicle manufacturers in the EU. The largest automakers tend to produce multiple brands, such as GM, Ford, DaimlerChrysler, Volkswagen, Fiat, and PSA Peugeot Citroën.[234] There are also a number of stand-alone automakers, such as Porsche, BMW, Bertone, Renault (recently partnered with Nissan), and MG Rover; several Japanese automakers (Honda, Toyota, Nissan, and Mitsubishi); and a number of specialty carmakers such as Caterham, Lotus, LTI Carbodies, MetroCab, Bugatti, and Morgan. In addition, companies such as Pininfarina, Karmann, Steyr-Daimler-Puch,[235] and Valmet design, engineer, and/or manufacture passenger vehicles for other automakers. There are also numerous truck and busmakers in the EU; many are divisions of the automakers listed above. Leading producers include Henlys, Iveco (Fiat's commercial vehicle unit), DaimlerChrysler, MAN, Scania, Volkswagen, and Volvo. Similar to the United States, truck and bus production is a very small percentage of overall motor vehicle production.

Total EU motor vehicle production increased steadily throughout the period, with passenger car production decreasing slightly in 2000 (table 11). Extra-EU exports account for around 20 percent of total production. The value of EU motor vehicle exports fluctuated during 1997-2000, with an average annual percentage increase of 6 percent (table 12). The EU runs a trade surplus in motor vehicles, and as such, the industry is an important component in the overall EU trade balance.[236]

Table 11
EU motor vehicle unit production, by type of vehicle,[1] 1997-2000

	1997	1998	1999	2000
Passenger cars	13,451,272	14,510,472	14,933,470	14,906,666
Light commercial vehicles	1,570,265	1,675,315	1,616,931	1,777,502
Trucks	334,562	379,094	394,211	417,235
Buses	36,672	35,397	33,788	35,314
Total	15,392,771	16,600,278	16,978,400	17,136,717

[1] These product breakouts are the categories used by the European Automobile Manufacturers Association. 'Light commercial vehicles' are analogous to the category 'light trucks' used when presenting U.S. industry data; 'trucks' are analogous to the category 'medium/heavy-duty trucks' in U.S. industry data tables.

Source: National Associations/European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/acea/index.html*, retrieved Apr. 25, 2002.

[234] GM brands include Opel, Vauxhall, and Saab; Ford brands include Ford, Volvo, Aston Martin, Jaguar, and Land Rover; DaimlerChrysler brands include Mercedes-Benz, Chrysler, and Smart; Volkswagen brands include Volkswagen, Audi, SEAT, Bentley, Lamborghini, and Rolls-Royce; Fiat brands include Fiat, Lancia, Alfa Romeo, Ferrari, and Maserati; and PSA Peugeot Citroën brands include Peugeot and Citroën.

[235] Steyr-Daimler-Puch is owned by Magna International of Canada.

[236] Eurostat, *Panorama of European Business,* p. 356.

Table 12
EU motor vehicle exports, by type of vehicle, in million EUR, 1997-2000

	1997	1998	1999	2000
Passenger cars	35,046	36,498	36,175	42,407
Light commercial vehicles	1,708	1,725	1,377	1,652
Trucks	4,167	4,257	3,520	4,309
Buses	590	719	484	577
Total	41,510	43,199	41,555	48,946

Source: National Associations/European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/acea/index.html*, retrieved May 3, 2002.

New registrations of motor vehicles increased by 13 percent during 1997-2001, with a slight decrease in 2000 (table 13). The EU reached a new record for motor vehicle sales in 1999, and the slight decline in 2000 was largely attributable to rising fuel prices and higher interest rates in the EU. The leading automakers in terms of West European passenger vehicle market share in 2001 were Volkswagen[237] (19 percent), PSA Peugeot Citroën (14 percent), Ford[238] (11 percent), GM[239](11 percent), and Renault (11 percent).[240]

Table 13
EU motor vehicle new registrations, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Passenger cars	13,005,029	13,940,823	14,632,826	14,319,107	14,418,837
Light commercial vehicles	1,444,738	1,620,811	1,804,794	1,853,891	1,787,240
Trucks and buses	273,355	320,057	360,157	391,964	381,066
Total	14,723,122	15,881,691	16,797,777	16,564,962	16,587,143

Source: National Associations/European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/acea/index.html*, retrieved Apr. 25, 2002.

EU consumer preferences differ from those in the United States; for example, light commercial vehicles, or light trucks, accounted for just 11 percent of total new EU passenger vehicle registrations in 2001, as compared to over 50 percent in the United States. A number of factors may act to limit market interest in light trucks (particularly larger models) in the EU, including higher fuel prices; factors such as population density, constricted urban areas, and narrower streets; and the popularity of station wagons in the EU. However, the compact minivan, introduced in the EU market by Renault in 1996, has found a growing market

[237] Includes Audi, SEAT, Skoda, and Volkswagen brands.
[238] Includes Ford, Jaguar, Land Rover, and Volvo brands.
[239] Includes GM USA, Opel, Vauxhall, and Saab brands.
[240] National Associations/European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/acea/index.html*, retrieved May 3, 2002.

niche.[241] Fuel-efficient diesel vehicles have grown in popularity in the EU as a response to high fuel prices and in tandem with improved diesel technology. In 1997, diesel-powered vehicles accounted for 30 percent of passenger vehicle sales; by 2001, this percentage had risen to 43.[242] In addition, EU consumers, relative to their U.S. counterparts, reportedly are less likely to try a new type of vehicle, less likely to change vehicle brands, and less interested in the application of technological advances (e.g., telematics, satellite radio) in their vehicles.[243]

The value of EU motor vehicle imports increased steadily during 1997-99, before declining 21 percent in 2000 (table 14). However, the value of imports registered an average annual increase of 4 percent during the period. In general, imports from North America have increased in recent years as German automaker investments in U.S. and Mexican production facilities have resulted in reverse exports back to Europe.

Table 14
EU motor vehicle imports, by type of vehicle, in million EUR, 1997-2000

	1997	1998	1999	2000
Passenger cars	16,122	20,616	23,185	17,471
Light commercial vehicles	1,595	1,868	2,065	2,308
Trucks	457	477	456	471
Buses	102	147	266	313
Total	18,275	23,109	25,972	20,563

Source: National Associations/European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/acea/index.html*, retrieved May 3, 2002.

There has been significant consolidation and restructuring of the industry located in Western Europe, including the merger of Daimler-Benz and Chrysler; the completion of GM's 100-percent acquisition of Saab and its equity stake in Fiat; Ford's acquisition of Jaguar, Land Rover, and Volvo's passenger car division; BMW's takeover (and subsequent sale) of Rover; and Volkswagen's acquisition of SEAT, Skoda, Bentley, and Lamborghini. Capacity reductions have also been announced during the period, with both GM and Ford announcing far-reaching restructuring strategies.[244] Finally, there were also numerous development, co-production, and supply arrangements that emerged during this period, among European producers as well as between European producers and foreign partners. However, some observers of the EU automotive industry assert that there is a need for more integration and rationalization within the region.[245]

[241] Just-auto editorial team, "The reasons why full-size minivans don't sell in Europe," May 30, 2000, found at Internet address *http://www.just-auto.com*, retrieved May 31, 2000.
[242] European Automobile Manufacturers Association, found at Internet address *http://www.acea.be/*, retrieved May 8, 2002.
[243] Automotive World, "Reorganising vehicle assembly in Western Europe," Oct. 31, 2000, found at Internet address *http://www.just-auto.com*, retrieved Jan. 29, 2001.
[244] "Europe: Build Will Outperform Market," *The Power Report*, Jan. 2001, p. 15.
[245] Automotive World, "Reorganising vehicle assembly in Western Europe."

The vehicle distribution system in Western Europe is currently in flux. Motor vehicle distribution has benefitted from a 'block exemption' from EU anti-trust rules, meaning that automakers have been able to grant dealers exclusive territories and dictate pricing, resulting in price variations throughout the region of up to 40 percent for identical vehicles.[246] In February 2002, the European Commission issued a set of draft rules that would remove the block exemption. Such action would facilitate the purchase of cars from other countries within the EU; broaden options for vehicle repairs; allow dealers to establish dealerships anywhere in the EU and market more than one brand in their showrooms; force automakers to offer dealers volume discounts comparable to those offered to fleet purchasers; and promote Internet and supermarket retailing.[247] Supporters of the removal of the block exemption contend that the new system will promote competition and result in lower vehicle prices for consumers.[248] The current block exemption framework expires on September 30, 2002; while the new system will likely loosen the control automakers have over dealers, some observers note that it is not likely that the market will be fully liberalized.[249]

Exchange rates and the introduction of euro in 1999 have affected EU industry developments in recent years. After its introduction on the Continent in 1999, the value of the euro fell relative to the dollar, yen, and sterling, while the sterling has been persistently strong. For those companies purchasing most of their inputs and selling most of their products in euros, the effect of the euro's depreciation was minimized. However, those companies whose products are manufactured with yen, sterling, or dollar inputs, but are sold in the euro zone, found their profits squeezed.[250] Some automakers reportedly tried to alleviate this risk by locking in euro rates as part of their contracts;[251] some also announced that, for their British manufacturing sites, they would replace some British content with inputs from the Continent,[252] or require that British suppliers write their contracts in euros.[253]

A 2001 study by AT Kearney predicted that the "wait-and-see" attitude of the British Government regarding the euro, along with overcapacity and a shift in demand toward Eastern Europe, would prompt plant closures in the United Kingdom and a shift in high volume car and parts manufacturing to the euro zone. Moreover, the study predicts that the

[246] Prices for passenger vehicles are reportedly highest in the United Kingdom, Germany, and Austria, and lowest in Spain, Greece, and Finland. However, tax rates on vehicle purchases vary greatly, with some of the low-priced countries charging the highest taxes. For example, an Opel model that retails for over 40 percent more in Germany than Finland actually costs less in Germany because of the tax regime in Finland. "European Union Finds That Car Prices Vary Up To 40% Across Europe," *The Autoparts Report*, vol. XV, No. 11, Mar. 6, 2002, p. 6.

[247] "European Union Finds that Car Prices Vary;" and Just-auto.com editorial team, "EC confirms block exemption end proposals," Feb. 6, 2002, found at Internet address *http://www.just-auto.com*, retrieved Feb. 6, 2002.

[248] Just-auto.com editorial team, "Proposed EU car sales shake-up hampers supermarkets, internet retailers," Jan. 11, 2002, found at Internet address *http://www.just-auto.com*, retrieved Jan. 11, 2002.

[249] Just-auto.com editorial team, "New EC rules loosen, but not remove manufacturers' hold over dealers," Feb. 7, 2002, found at Internet address *http://www.just-auto.com*, retrieved Feb. 7, 2002.

[250] Barbara McClellan, "Currency Conundrum: Europe's weak euro hurts some, helps others," *Ward's Auto World*, July 2000, p. 67.

[251] Ibid.

[252] Wim Oude Weernink, "Toyota acts to end European Losses," *Automotive News,* Mar. 19, 2001, p. 24; and "Nissan To Increase Euro-Based Procurement For UK Plants," *The Japan Automotive Digest*, vol. VII, No. 31, Sept. 3, 2001, p. 5.

[253] "Toyota Said It Will Source More Parts In The EU," *The Autoparts Report*, vol. XV, No. 17, June 7, 2002, p. 6.

remaining operations in the United Kingdom would rely so heavily on euro-zone inputs that they would, in effect, become "screwdriver" assembly operations with little local value added. Finally, the study predicts that in the long term, the automakers that remain in the United Kingdom may just be luxury automakers such as Jaguar, Land Rover, and BMW.[254]

However, despite these predictions, there have been many announcements of new investment in the British industry, albeit most of them tempered with promises to decrease British content. BMW announced it would invest $1.5 billion in Britain by the end of 2002 to modernize the plant in Oxford for production of the new Mini, and add facilities for the new generation of Rolls Royce beginning production in 2003 (however, BMW claimed that the strength of the British pound was a factor in its decision to sell Rover). Similarly, Nissan announced in early 2001 it would expand its Sunderland plant to accommodate production of the new Micra subcompact beginning in December 2002 (influenced by a £40 million government subsidy).[255] Toyota announced plans to increase production at Burnaston, moving production of 50,000 Corolla hatchbacks from Japan to Burnaston by 2002 and boosting that plant to 100 percent capacity. Honda decided to proceed with its expansion of Swindon, adding a new facility to build Civic hatchbacks and CR-Vs. However, Honda is exporting some Swindon output to the United States and Japan for the first time, due to the reduced profitability of sales to the Continent.[256]

Ford and GM both announced cutbacks in the United Kingdom in 2000 as part of their broad restructuring plans for Europe; Ford announced that it would end production of the Fiesta at Dagenham,[257] and GM announced that it would end production of the Vectra at the Vauxhall plant in Luton.[258] However, Ford did invest in boosting engine building capacity at Bridgend, and GM announced it would build the next-generation Vectra at the Vauxhall plant in Ellesmere Port.[259] Ford affiliate Jaguar also pledged investment at Halewood where the X-type would replace the Escort.[260]

---

[254] For more information, see AT Kearney, "The Future of the U.K. Automotive Industry," 2001, found at Internet address *http://www.atkearney.com*.

[255] Kim Willenson, "Subsidy in Hand, Nissan Announces It Will Spend £235 Million to Keep Micra Production in U.K.," *The Japan Automotive Digest*, vol. VII, No. 3, Jan. 29, 2001, p. 1.

[256] "Honda Will Use New Swindon Plant To Export Back To Japan As Well As To U.S.," *The Japan Automotive Digest*, vol. VII, No. 33, Sept. 17, 2001, p. 5.

[257] "Ford U.K. operations remain firmly in the red," *Ward's Automotive International*, vol. 16, No. 19, Oct. 2001, p. 9.

[258] Ford, GM announce U.K. investments," *Ward's Automotive International*, vol. 16, No. 4, Feb. 2001, p. 3.

[259] Ibid.

[260] Julian Rendell, "Made in Britain, maybe," *Autocar*, Jan. 24, 2001, p. 18.

Japan

The automotive industry in Japan is a key component in the national economy. Motor vehicle and related industries account for over 13 percent of the country's total manufacturing output and 10 percent of the country's jobs.[261] There are 11 motor vehicle manufacturers in Japan, 9 of which produce passenger vehicles: Daihatsu Motor Co., Ltd., Fuji Heavy Industries, Ltd., Honda Motor Co., Ltd., Isuzu Motors Ltd., Mazda Motor Corp., Mitsubishi Motors Corp., Nissan Motor Co., Ltd., Suzuki Motor Corp., and Toyota Motor Corp. All of these have manufacturing operations in the United States with the exception of Daihatsu and Suzuki; Suzuki does participate in the CAMI Automotive, Inc. joint venture with GM, located in Canada.

Japan is the third-leading producer of cars and trucks behind the EU and the United States. The Japanese automotive industry has traditionally been viewed as the leading competitor for the U.S. auto industry in most regions of the world, including North America. In 2001, Japanese automakers produced 8.1 million passenger cars (table 15), and exported 44 percent of these vehicles (table 16). The United States is by far the leading market for Japanese vehicle exports, receiving over 35 percent of such exports in 2000.[262]

Japanese motor vehicle production has fluctuated downward during 1997-2001, with 2000 the only year with a minor increase. During the last 5-10 years, the Japanese auto industry has implemented major structural changes in reaction to a number of factors. The industry has suffered the effects of overcapacity in recent years, resulting from a prolonged slump in domestic demand.[263] In addition, the financial crisis in Southeast Asia in 1997 dealt a serious blow to Japanese automotive exports to that region.[264] Japanese automakers have sold unprofitable assets, reduced capacity through plant closures, and, with the exception of Toyota and Honda, have offered equity stakes to foreign automakers in order to gain financial and managerial assistance. Ford has a controlling interest in Mazda; GM has equity stakes in Subaru and Suzuki, and a controlling interest in Isuzu; DaimlerChrysler has a

[261] International Trade Administration, U.S. Department of Commerce, "Automobile Industry," Industry Sector Analysis, Nov. 2, 2001, found at Internet address *http://www.stat-usa.gov*, retrieved Apr. 30, 2002.

[262] JAN Corporation, *Facts and Info 2001: A Guide to Japan's Auto Industry* (Tokyo: JAN Corporation, 2001), p. 148.

[263] Just-auto.com editorial team, "The Japanese vehicle industry in review," Oct. 11, 2001, found at Internet address *http://www.just-auto.com*, retrieved Oct. 19, 2001.

[264] Total motor vehicle unit exports from Japan to the region reached 620,177 in 1996; in 1997 the decline was relatively small, to 606,410. However, in 1998, Japanese exports fell 56 percent to 265,172 vehicles. Japan exported 290,582 vehicles to the region in 1999 and 410,607 in 2000. *World Automotive Market Report* (Chicago, IL: Auto and Truck International), various years.

Table 15
Japanese motor vehicle unit production, by type of vehicle,[1] 1997-2001

	1997	1998	1999	2000	2001
Cars	8,491,440	8,055,763	8,100,169	8,363,485	8,117,563
Trucks	2,421,413	1,937,076	1,746,912	1,726,818	1,601,536
Buses	62,234	56,953	48,395	54,544	58,092
Total	10,975,087	10,049,792	9,895,476	10,144,847	9,777,191

[1] These product breakouts are the categories used by the Japan Automobile Manufacturers Association. 'Cars' are analogous to the category 'passenger cars' used when presenting U.S. industry data; 'trucks' would include light trucks and medium/heavy-duty trucks.

Source: Japan Automobile Manufacturers Association, found at Internet address *http://www.japanauto.com.*, retrieved May 1, 2002.

Table 16
Japanese motor vehicle unit exports, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	3,578,658	3,684,150	3,757,460	3,795,854	3,568,797
Trucks	919,908	795,808	613,113	617,870	552,891
Buses	54,602	48,917	38,380	41,163	44,481
Total	4,553,168	4,528,875	4,408,953	4,454,887	4,166,169

Source: Japan Automobile Manufacturers Association, found at Internet address *http://www.japanauto.com*, retrieved May 1, 2002.

controlling interest in Mitsubishi; and Renault has a controlling interest in Nissan.[265] Although in the past each Japanese automaker offered passenger cars in each vehicle segment, regardless of the volume of sales it could garner, some automakers reportedly suffered because they were unable to achieve economies of scale in every segment.[266] Makers have taken steps to drop unprofitable segments, consolidate platforms internally, consolidate platforms with their foreign equity partners, devise more efficient regional sourcing strategies, and rationalize production, product portfolios, and supplier networks.[267]

Total motor vehicle sales in Japan have followed the same pattern as production, fluctuating downward with a modest uptick in 2000 (table 17). However, while sales of passenger cars bottomed out in 1998, increasing modestly in 1999-2001, truck sales continued to decline throughout the period, with an average annual decrease of nearly 8 percent.

[265] Japan Automobile Manufacturers Association, "Globalization of the Automotive Industry in Japan," *The JAMA Forum*, vol. 19, No. 1, 2001, p. 4.

[266] CSM Worldwide, "The restructuring of the Japanese and Korean auto industries," Nov. 13, 2000, found at Internet address *http://www.just-auto.com*, retrieved May 13, 2002.

[267] Ibid.

Table 17
Japanese motor vehicle unit sales, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	4,492,006	4,093,148	4,154,084	4,259,872	4,289,683
Trucks	2,217,257	1,772,136	1,692,654	1,686,599	1,600,858
Buses	15,763	14,141	14,478	16,571	15,932
Total	6,725,026	5,879,425	5,861,216	5,963,042	5,606,473

Source: Japan Automobile Manufacturers Association, found at Internet address *http://www.japanauto.com*, retrieved Apr. 25, 2002.

Imports account for a much smaller percentage of total sales in Japan as compared to the United States; in 2001, imports accounted for 5 percent of motor vehicle sales in Japan (table 18). However, imports from Japanese factories overseas accounted for just 7 percent of total Japanese imports in 2000,[268] indicating that, while imports are a small portion of total sales, they are mostly made up of non-Japanese brands. German imports are most popular in Japan, with DaimlerChrysler[269] (27 percent), Volkswagen[270] (24 percent), and BMW[271] (16 percent) accounting for the highest passenger car import market shares in 2001. Ford[272] ranked fourth, accounting for 13 percent of the import market, followed by GM[273] with 7 percent.[274] By region, in 2001, imports from the EU accounted for 70 percent of total motor vehicle imports, followed by North America (18 percent), Eastern Europe (5 percent), and Africa (5 percent).[275]

Table 18
Japanese motor vehicle unit imports, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	371,113	268,795	259,736	285,582	287,116
Trucks	3,906	1,708	1,116	1,383	1,753
Buses	73	78	57	87	74
Total	375,092	270,581	260,909	287,052	288,943

Source: Japan Automobile Manufacturers Association, found at Internet address *http://www.japanauto.com*, retrieved Apr. 25, 2002.

[268] JAN Corporation, *Facts and Info 2001*, p. 154.
[269] Includes Mercedes-Benz, Chrysler, and Smart brands.
[270] Includes Volkswagen and Audi brands.
[271] Includes BMW and Mini brands.
[272] Includes Ford, Volvo, Land Rover, Jaguar, and Aston Martin. Volvo accounted for more than one- half of Ford's total Japanese imports.
[273] Includes Chevrolet, Cadillac, Saturn, Opel, and Saab. Opel, GM's European brand, accounted for 43 percent, and Chevrolet, 30 percent, of GM's total Japanese imports.
[274] Japan Automobile Manufacturers Association, *Japan Auto Trends*, vol. 6, No. 1, Mar. 2002, p. 7b.
[275] Data provided by Japan Automobile Manufacturers Association, May 21, 2002.

Quality Study, which surveys the U.S. market, Japanese nameplate vehicles finished in the top spot in 12 of 14 passenger car and light truck categories.[276] The high standards for quality that are embraced by Japanese automakers are also embraced by the Japanese consumer, who demands a defect-free vehicle and a high level of after-sales service from dealers.[277] Japanese consumers also prefer smaller vehicles; vehicles with an engine displacement of 2,000 cc and less accounted for nearly 83 percent of the market in 2001. At the same time, large cars with an engine displacement of over 2,000 cc accounted for 84 percent of total passenger car imports.[278] The price and quality competition in Japan from domestic brands is reportedly difficult to surmount.

In general, the typical Japanese consumer purchases new vehicles as opposed to used vehicles, keeps the vehicle mileage relatively low, and trades vehicles in after 3 to 5 years. Therefore, Japan has approximately 8 million like-new used vehicles to sell annually; most of these are sold throughout Asia.[279] This high turnover in new vehicle purchases may be at least partly attributable to the *shaken* inspection system, whereby passenger vehicles are subject to a schedule of thorough safety inspections, the first of which occurs 3 years after the vehicle is purchased.[280] The United States has asked Japan to eliminate the *shaken* system, which it views as a nontariff barrier to market access and unnecessarily burdensome for the Japanese consumer.[281]

Motor vehicles are sold in Japan through nationwide dealer networks, agencies, and local representatives; imports can come directly from manufacturers to dealers with national sales networks, or distributors can purchase imported vehicles from importers, and then resell them through agencies and local representatives. Unlike in the United States, dealers of domestic brands have strong financial ties to the automakers they represent; a reported 40 percent of domestic brand dealers have long term debts with the automakers whose cars they sell. Such financial dependence is generally not the case with import dealers.[282]

---

[276] *Automotive News Market Data Book 2001*, p. 11.
[277] International Trade Administration, "Automobile Industry."
[278] Japan Automobile Manufacturers Association, *Japan Auto Trends*, vol. 6, No. 1, Mar. 2002, p. 7b.
[279] International Trade Administration, "Automobile Industry."
[280] For more information on the motor vehicle registration and inspection system in Japan, see *http://www.mlit.go.jp/english/inspect/car13e.html*.
[281] International Trade Administration, "Automobile Industry."
[282] Ibid.

Korea

Korea is the fourth-leading automobile producer in the world, turning out 3.7 million motor vehicles in 2001 (table 19). Truck and bus production accounts for a comparatively large share of motor vehicle production in Korea, reaching 13 percent in 2001. There are seven motor vehicle manufacturers in Korea: Hyundai, Daewoo, Kia, Ssangyong, Asia Motors, Samsung, and Jindo.[283] Korea is the third-largest automobile exporter in the world, exporting 56 percent of its domestic passenger car production and 41 percent of its total motor vehicle production (table 20). Nearly one-third of those exports is destined for the United States. Quality improvements and competitive pricing have helped Korean automakers penetrate overseas markets, particularly the United States.[284] Korean automakers are also focusing on designing products to meet particular consumer needs and tastes; for example, Hyundai's most recent entry into the U.S. passenger vehicle market, its Santa Fe SUV, is the automaker's first vehicle designed in the United States at Hyundai's Los Angeles design center.[285]

Table 19
Korean motor vehicle unit production, by type of vehicle,[1] 1997-2001

	1997	1998	1999	2000	2001
Passenger cars	2,308,476	1,625,125	2,361,735	2,602,008	2,471,444
Multi-purpose vehicles	216,552	195,895	466,705	721,218	755,969
Trucks	248,200	161,594	242,234	256,370	238,876
Buses	242,871	159,687	228,282	246,288	225,027
Total	3,016,099	2,142,301	3,298,956	3,825,884	3,691,316

[1] These product breakouts are the categories used by the Korea Automobile Manufacturers Association. Multi-purpose vehicles include SUVs, minivans, and station wagons; 'trucks' would include pickup trucks, medium-duty trucks, and heavy-duty trucks.

Source: Korea Automobile Manufacturers Association, found at Internet address *http://www.kama.or.kr/*, retrieved Apr. 25, 2002.

Table 20
Korean motor vehicle unit exports, by type of vehicle,[1] 1997-2001

	1997	1998	1999	2000	2001
Passenger cars	1,155,893	1,228,144	1,390,072	1,544,473	1,397,015
Trucks	53,640	43,080	39,320	47,848	35,446
Buses	107,067	89,726	78,522	83,585	67,871
Total	1,316,600	1,360,950	1,507,914	1,675,906	1,500,332

[1] The Korea Automobile Manufacturers Association does not break out multi-purpose vehicles in its export statistics; these vehicles are accounted for in the passenger car category.

Source: Korea Automobile Manufacturers Association, found at Internet address *http://www.kama.or.kr/*, retrieved Apr. 25, 2002.

[283] Jindo is a manufacturer of trucks only.
[284] Joe Kohn, "The Koreans move up," *Automotive News*, Sept. 3, 2001, p. 1.
[285] R. Ben Weber, "A New Hyundai for America," *Korea Insight*, Korea Economic Institute, vol. 4, No. 5, May 2002, p. 3.

Following years of growth, Korean automobile production experienced a sharp decline in 1998 as domestic consumption declined by roughly 50 percent following the financial crisis (table 21). However, production rose again in 1999 to pre-crisis levels, and export sales grew throughout the period, except for a nearly 10-percent drop in 2001. The Korean market is not nearly as saturated as other major producing nations, with 5.9 people per passenger car in operation, contrasted with 2.4 in Japan, 1.9 in Germany, and 2.2 in the United States.[286]

Table 21
Korean motor vehicle unit sales, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Passenger cars	1,151,287	568,063	910,725	1,057,620	1,065,161
Multi-purpose vehicles	139,275	93,554	272,506	31,958	407,678
Trucks	208,884	128,284	198,286	204,194	211,151
Buses	133,615	75,185	153,889	158,821	164,498
Total	1,633,061	865,086	1,535,406	1,452,593	1,848,488

Source: Korea Automobile Manufacturers Association, found at Internet address *http://www.kama.or.kr/*, retrieved Apr. 25, 2002.

Korea is the sixth-largest motor vehicle market in the world; however, as mentioned earlier, imports account for less than 1 percent of motor vehicle sales in Korea. Motor vehicle imports were prohibited in Korea until 1987, and imports from Japan were only permitted beginning in 1999. According to the Korea Automobile Importers and Distributors Association, Korea imported 7,747 cars in 2001, accounting for 0.7 percent of the market, up from 4,414 cars, or 0.4 percent of the market, in 2000. Passenger car imports reportedly peaked in 1996 at 10,315 before the Asian financial crisis.[287] The U.S. industry has repeatedly cited Korea as maintaining barriers to imported motor vehicles, and the U.S. Government negotiated two MOUs with the Korean Government in 1995 and 1998 in an effort to address some of these structural impediments (see section of U.S. government trade-related investigations).

Many Korean passenger vehicle producers were left in poor financial positions following the Asian financial crisis, and the industry suffered from overcapacity.[288] Significant consolidation among domestic makers and investment from foreign manufacturers has begun to reshape the industry.[289] Hyundai acquired Kia and Asia Motors in 1999, and sold a 10-percent equity stake to DaimlerChrysler in 2000. Daewoo took a 51.98-percent equity stake in Ssangyong in 1998, and was in the market for a new owner itself for a number of years before finally closing a deal with GM in 2002, in which GM took a 42-percent equity

[286] *Ward's World Motor Vehicle Data 2001*, various pages.

[287] Just-auto.com editorial team, "Car Imports Jump 76% to 7,747 in 2001," Jan. 4, 2002, found at Internet address *http://www.just-auto.com*, retrieved Jan. 4, 2002.

[288] Knibb Gormezano & Partners, "Korea - Recovery and Restructuring," July 27, 2000, found at Internet address *http://www.just-auto.com*, retrieved Aug. 3, 2000.

[289] CSM Worldwide, "The restructuring of the Japanese and Korean auto industries."

stake.[290] Mercedes also has a 3-percent stake in Ssangyong that predates Daewoo's. Samsung was acquired by Renault of France in 2000.

As in Japan, Korean automakers have traditionally offered passenger cars in each vehicle segment, regardless of sales volumes, which was unprofitable for some automakers that were unable to achieve economies of scale in every segment.[291] Some industry observers state that to become more efficient and competitive in domestic and foreign markets, Korean makers must consolidate platforms internally; consolidate platforms with their foreign equity partners; devise more efficient regional sourcing strategies; and rationalize production, product portfolios, and supplier networks.[292]

Canada

Canada is the fifth-largest motor vehicle producer and market in the world. The automotive industry accounts for as many as one in five Canadian jobs,[293] and 25 percent of Canada's total merchandise exports.[294] As noted earlier, the Canadian auto industry is highly integrated with that of the United States. GM, Ford, and Chrysler accounted for 75 percent of passenger car and light truck production in Canada in 2001. Other automakers with a manufacturing presence in Canada are Honda, Toyota, and Suzuki through a joint venture with GM called CAMI. Volvo produced the 70 Series in Halifax, Nova Scotia until 1998. With the exception of a GM plant in Ste-Thérèse, Québec, which is slated to close in September 2002, all Canadian passenger vehicle production is in Ontario, within relatively close proximity to Detroit. Commercial vehicle producers in Canada include Freightliner, Navistar, Paccar, and Western Star;[295] commercial vehicle production accounts for just 1 percent of total motor vehicle production (table 22).

Total motor vehicle production fluctuated during 1997-2001, rising to a peak in 1999 and declining thereafter. However, sales have grown throughout the period, indicating that imports have increased their market share (table 23). In addition to increased imports from outside the NAFTA region, imports from Mexico increased by an annual average of nearly 15 percent during 1997-2001. U.S. exports to Canada decreased during the period (see section on U.S. exports).

---

[290] The agreement, signed by GM, Daewoo Motor Company, and the Korea Development Bank, established a new company that will own and operate selected domestic and foreign assets of Daewoo Motor Company. Just-auto.com editorial team, "Despite protesters, GM, Daewoo and creditors finally sign deal," Apr. 30, 2002, found at Internet address *http://www.just-auto.com*, retrieved Apr. 30, 2002.

[291] CSM Worldwide, "The restructuring of the Japanese and Korean auto industries."

[292] Ibid.

[293] According to Canadian Auto Workers union president Buzz Hargrove. "Ste. Therese Another Blow to CAW," *Ward's Automotive Reports*, vol. 76, No. 37, Oct. 1, 2001, p. 1.

[294] Carlos Gomes, "Canadian Auto Report," Scotia Economics, Nov. 30, 2001, found at Internet address *http://www.scotiabank.com*, retrieved Mar. 28, 2002.

[295] In late 2001, DaimlerChrysler announced that it planned to close its Thomas Built bus factory in Ontario and the Western Star truck plant in British Columbia.

Table 22
Canadian motor vehicle unit production, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	1,372,588	1,481,141	1,625,113	1,550,500	1,274,853
Light trucks	1,160,823	1,040,443	1,359,380	1,364,849	1,228,785
Medium/heavy-duty trucks	36,942	48,737	61,006	46,287	28,725
Total	2,570,353	2,570,321	3,045,499	2,961,636	2,532,363

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; Industry Canada, *Quarterly Automotive Circular*, January to December 1999; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

Table 23
Canadian passenger vehicle unit imports from outside the NAFTA region, by source, 1997-2001

	1997	1998	1999	2000	2001
Europe	25,246	31,429	48,542	46,561	42,859
Japan	118,501	152,222	161,447	162,194	183,031
Korea	19,762	23,355	33,722	56,420	86,746
Total	163,509	207,006	243,711	265,175	312,636

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

The Canadian market for motor vehicles grew steadily during 1997-2001, at an average annual rate of nearly 3 percent (table 24). The strength of the market during this period is attributable to the strong Canadian economy, as well as the fact that the fleet of passenger vehicles in Canada is aging, spurring new replacement vehicle purchases. A reported 40 percent of the Canadian passenger vehicle fleet in 2000 was at least 10 years old.[296]

Table 24
Canadian motor vehicle unit sales, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	736,477	741,129	806,808	843,425	856,372
Light trucks	649,787	642,780	687,832	694,001	694,676
Medium/heavy-duty trucks	32,589	36,605	39,294	46,116	33,866
Buses[1]	1,702	1,610	2,224	1,985	2,011
Total	1,420,555	1,422,124	1,536,158	1,585,527	1,586,925

[1] Does not include urban/intercity buses.

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; Industry Canada, *Quarterly Automotive Circular*, January to December 1999; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

[296] Alisa Priddle, "Canada's on a Roll," *Ward's Auto World,* Dec. 2000, p. 68.

Future strength of the Canadian passenger vehicle market is predicated on a number of observations. First, Canada is reportedly the only major world economy whose citizens purchased fewer new passenger vehicles during the 1990s than during the 1980s, rendering the fleet of privately owned vehicles in need of replacement.[297] Second, the Canadian market tends to shadow trends in the U.S. market by 3 years, indicating that, as U.S. sales may have entered a downturn beginning in 2001, Canadian sales will likely continue to grow for a few more years.[298] Third, Canadian used car exports to the United States soared during the latter half of the1990s; U.S. retailers discovered Canadian auctions as a cheap source of used vehicles for resale in the United States, reducing the availability of used cars to Canadian consumers.[299] Finally, the strong growth of vehicle leasing during the 1990s (by 1998, 40 percent of all new vehicle transactions in Canada were lease deals) means that many consumers with expiring leases will be returning to the market for new vehicle purchases or leases.[300]

The system of taxation in Canada greatly influences the passenger vehicle market. Canadians are subject to a much higher income tax burden, which diminishes their purchasing power. This leads many in lower income brackets to choose used vehicles instead of new vehicles, and gives a larger share of new vehicle sales to compact cars.[301] Moreover, while MSRPs are in fact lower in Canada than in the United States, the actual purchase price is comparable, owing to an extensive list of unique taxes such as air conditioning taxes, tire taxes, battery taxes, as well as taxes similar to those found in the United States, like fuel economy taxes and luxury vehicle taxes. Industry experts estimate that the tax burden on new vehicle purchases in Canada is as much as 12 percent more than the tax burden in the United States.[302]

The close integration of the U.S. and Canadian auto industry is largely attributable to the 1965 U.S.-Canada Automotive Products Trade Agreement (Auto Pact). Auto Pact established a 'conditional free-trade zone' between the United States and Canada for motor vehicles and original equipment parts, with specified local content and other requirements. A key feature of the agreement allowed GM, Ford, and DaimlerChrysler to import into Canada their affiliate automakers' vehicles from third countries; i.e., GM could import Saab, Isuzu, and Suzuki products, Ford could import Jaguar and Volvo products, and DaimlerChrysler could import Mercedes-Benz products free of duty.[303] However, Japanese automakers Toyota, Honda, and Suzuki, which manufacture significant numbers of vehicles in Canada, were excluded from Auto Pact. Safeguards were negotiated as part of the Auto Pact; important among them were specified production-to-sales ratios for both cars and light trucks, necessitating that automakers must have both car and light truck production in

[297] Bob English, "Canada ends century with second-best sales," *Automotive News*, Jan. 17, 2000, p. 52.

[298] Priddle, "Canada's on a Roll," p. 68.

[299] Ibid.

[300] Carlos Gomes, "Canadian Auto Report," Scotia Economics, April 8, 2002, found at Internet address *http://www.scotiabank.com*, retrieved May 7, 2002.

[301] The compact car segment is reportedly the sales leader in Canada, as opposed to the mid-sized car segment in the United States. Dennis DesRosiers, "Canadian MSRPs," Oct. 12, 2000, found at Internet address *http://www.just-auto.com*, retrieved Jan. 29, 2001.

[302] Ibid.

[303] Dennis DesRosiers, "Auto Pact II," DesRosiers Automotive Reports, vol. 15, Issue 3, Feb. 28, 2001, found at Internet address *http://www.desrosiers.ca*, retrieved March 28, 2002.

Canada.[304] In addition, a ratio of imports to domestically produced vehicles had to be maintained. Canadian industry observers credit safeguards with the rapid growth of the Canadian industry during the 1970s and 1980s.[305]

Auto Pact was made largely redundant by the U.S.-Canada Free Trade Agreement in 1989 (which was in turn superseded by the North American Free Trade Agreement in 1994) because it lost the ability to enforce the safeguard penalties.[306] However, the provision allowing duty-free third-country imports by Auto Pact companies remained until the WTO ruled in 1999, in response to a case brought by the EU and Japan in 1998, that Auto Pact violated most-favored-nation and national treatment provisions of the 1994 General Agreement on Tariffs and Trade, and that the third-country import duty exemption scheme constituted an export subsidy, which is also illegal under WTO rules.[307] Canada appealed the WTO decision, which was upheld in May 2000, and was given until February 19, 2001, to comply with the WTO ruling. Subsequently, all non-NAFTA passenger vehicle imports have been charged the Canadian tariff rate of 6.1 percent ad valorem.[308] However, because non-NAFTA imports of Auto Pact members only accounted for 1.8 percent of the market in 2000, the effect on these companies will likely be minimal.[309] In 2000, nearly 85 percent of auto imports entered Canada free of duty.[310]

The Canadian automotive industry has benefitted from billions of dollars in announced investments by GM, Ford, DaimlerChrysler, and Toyota during 1997-2001. In addition, significant investments have been made in establishing or expanding upon R&D facilities in Canada, indicating that Canada is emerging as a global powerhouse in automotive engineering.[311] According to one industry expert, automotive R&D as a Canadian industry was virtually nonexistent in 1990; by 2000 there were between 2,000 and 3,000 automotive engineers working in Canada, and by 2005, this number could expand to as many as 10,000.[312]

---

[304] Ibid.
[305] Ibid.
[306] Ibid.
[307] See World Trade Organization, "Canada - Certain Measures Affecting the Automotive Industry, Report of the Panel," found at *http://www.wto.org/wto/english/tratop_e/dispu_e/6100d.pdf*.
[308] Former Auto Pact members Ford and DaimlerChrysler reportedly have asked Canada to institute a program allowing 'substitution drawbacks,' which would allow automakers to receive credits for vehicle exports that could be applied to the 6.1 percent ad valorem duty they incur when importing vehicles from outside NAFTA. These companies assert that such a program would not be easily challenged in the WTO.
[309] DesRosiers, "Auto Pact II."
[310] Ibid.
[311] Ibid.
[312] Priddle, "Canada's on a Roll," p. 68.

Mexico

Mexico is the sixth-largest motor vehicle producer in the world and the tenth-largest market. As with Canada, the Mexican motor vehicle industry is highly integrated with that of the United States, and is composed almost entirely of subsidiaries of foreign manufacturers that determine the local product mix and local production levels as part of their global vehicle manufacturing strategies. Volkswagen is the leading passenger car producer in Mexico, accounting for 38 percent of Mexican car production in 2001; however, counting passenger cars and light trucks together, the leading producer is GM (24 percent), followed closely by DaimlerChrysler (23 percent). Volkswagen, Nissan, and Ford rank third, fourth, and fifth, respectively.[313] Other manufacturers of passenger cars and light trucks in Mexico include BMW, Honda, and Renault.[314] Medium- and heavy-duty truck vehicle assemblers in Mexico include GM, Ford, DaimlerChrysler (Freightliner and Mercedes-Benz brands), Paccar (Kenworth brand), Navistar, Oshkosh, Scania, and Dina, a traditionally Mexican motor vehicle company.[315] Bus makers in Mexico include Dina, Mexicana de Autobuses (owned by Volvo since 1998), and Scania. As in the United States, commercial vehicles account for approximately 3 percent of total motor vehicle production in Mexico.

Although commercial vehicle production has fluctuated widely throughout the period, passenger vehicle production grew strongly during 1997-2000, before dipping slightly in 2001 (table 25). Passenger vehicle production increased during 1997-2001 by an average annual rate of 8 percent. Passenger cars accounted for 55 percent, and light trucks, 45 percent, of Mexican passenger vehicle production in 2001. The Mexican industry grew significantly during the latter half of the 1990s partly as a result of the complete elimination of U.S. tariffs on trucks originating in Mexico in 1998 and the strong growth in the U.S. passenger vehicle market.[316]

Table 25
Mexican motor vehicle unit production, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	854,818	956,354	992,140	1,130,488	1,000,633
Light trucks	477,337	444,573	451,331	737,773	807,144
Medium/heavy-duty trucks	22,454	58,964	87,357	54,628	49,255
Total	1,354,609	1,459,891	1,530,828	1,922,889	1,857,032

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; Industry Canada, *Quarterly Automotive Circular*, January to December 1999; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

313 Industry Canada, *Semi-Annual Automotive Circular*, Jan.-Dec. 2001, pp. 29-30.

314 Industry Canada, *Semi-Annual Automotive Circular*, Jan.-Dec. 2001, p. 29.

315 Dina closed its doors in late 2001 in response to severe financial problems and the downturn in the North American truck market. The company hopes to re-emerge when the market turns around. Reuters, "Grupo Dina goes into hibernation," Oct. 5, 2001, found at Internet address *http://www.just-auto.com* retrieved Oct. 5, 2001.

316 Just-auto.com editorial team, "Turbulence roils in the automotive industry in Latin America: Mexico, Brazil, and Argentina, 1995-2005," May 8, 2001, found at Internet address *http://www.just-auto.com*, retrieved Apr. 26, 2002.

A very high percentage of Mexican passenger vehicle production is for export, mostly to the United States. In 2001, 65 percent of passenger cars and 90 percent of light trucks were exported (table 26). In 1997, these percentages were 70 and 81, respectively. By contrast, only 35 percent of the medium- and heavy-duty trucks produced in 2001 were for export.[317]

Table 26
Mexican motor vehicle unit exports, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	593,086	600,696	675,953	787,478	651,060
Light trucks	386,705	352,491	356,814	630,946	729,907
Medium/heavy-duty trucks	64	30,888	44,170	16,247	17,457
Total	979,855	984,075	1,076,937	1,434,671	1,398,424

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; Industry Canada, *Quarterly Automotive Circular*, January to December 1999; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

The Mexican automotive industry emerged from the country's 1995 economic crisis in a strong competitive position. Because of its strategic geographic location, level of manufacturing competence, and existing automotive manufacturing infrastructure, Mexico was chosen as the lead North American assembly site for numerous key new vehicle programs, including DaimlerChrysler's PT Cruiser, which was originally sole-sourced for global distribution from Toluca; the new Volkswagen Beetle, which is sole-sourced from Puebla; and the Ford Focus, for which Hermosillo was chosen as one of only two North American production sites. In addition, GM launched the Pontiac Aztek, Buick Rendezvous, and new Suburban/Yukon XL in Mexico; and Aguascalientes was chosen as the sole North American source for Nissan's redesigned 2001 Sentra.[318] The Mexican industry has demonstrated significant improvements in labor productivity, product quality, and competitiveness in recent years. Vehicle quality is reportedly on par with vehicles built in the United States or Canada, and some industry observers report that despite extensive reliance on manual labor, many Mexican plants have better labor productivity than comparable U.S. and Canadian plants.[319]

The Mexican motor vehicle market has grown steadily during 1997-2001, with total motor vehicle sales growing by an average annual rate of 17 percent (table 27). Although light trucks have accounted for ever larger portions of U.S. sales in recent years, passenger car sales have increased significantly in Mexico, while the light truck market continues to be influenced more by factors associated with commercial vehicle sales. Passenger car sales in Mexico increased by an average annual rate of 22 percent during 1997-2001, while light truck sales grew by a more modest 8 percent.

[317] Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001, pp. 29-30; and Industry Canada, *Quarterly Automotive Circular*, January to December 1998, pp. 22-23.
[318] Brian Corbett, Drew Winter, and Katherine Zachary, "Ay Caramba! Mexico is heading into the automotive big leagues," *Ward's Auto World*, May 2000, p. 50.
[319] Ibid.

Table 27
Mexican motor vehicle unit sales, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	303,558	430,199	465,063	599,285	667,566
Light trucks	182,198	211,817	213,592	266,425	244,842
Medium/heavy-duty trucks	16,903	23,368	27,487	36,662	30,086
Total	502,659	665,384	706,142	902,372	942,494

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; Industry Canada, *Quarterly Automotive Circular*, January to December 1999; Industry Canada, *Quarterly Automotive Circular*, January to December 1998.

Imports from outside the NAFTA region accounted for 29 percent of total passenger car sales in Mexico in 2001, up steeply from just 2 percent in 1997 (table 28). Imports of light trucks accounted for 14 percent of total light truck sales in 2001. For passenger cars and light trucks combined, the leading non-NAFTA import sources were South America (40 percent of non-NAFTA imports); Europe (36 percent); Korea (10 percent); and Japan (4 percent).[320]

Table 28
Mexican passenger vehicle unit imports from outside the NAFTA region, by type of vehicle, 1997-2001

	1997	1998	1999	2000	2001
Cars	6,732	27,560	55,490	139,487	188,602
Light trucks	7,499	10,341	15,885	27,382	34,540
Total	14,231	37,901	71,375	166,869	223,142

Source: Industry Canada, *Semi-Annual Automotive Circular*, January to December 2001; and Industry Canada, *Quarterly Automotive Circular*, January to December 1999.

The pace at which non-NAFTA import penetration of the Mexican market has grown can be at least partly attributed to Mexico's bilateral trade agreements with numerous countries/regions,[321] including Brazil, Chile, Colombia, Venezuela, Bolivia, Costa Rica, Nicaragua, Guatemala, El Salvador, Honduras, Israel, the EU, EFTA, and Singapore. In late 2001, Mexico and Panama resumed FTA talks; an agreement with Panama would provide Mexico with free-trade status with all of Central America. These agreements have also increased the attractiveness of Mexico as a production site;[322] the country has received billions of dollars of investment in recent years.

[320] Industry Canada, *Semi-Annual Automotive Circular,* January to December 2001, p. 13.
[321] Automotive World, "Mexico the land of the Aztecs offers a promising future for vehicle manufacturers," Oct. 9, 2001, found at *http://www.just-auto.com*, retrieved Oct. 10, 2001.
[322] Ibid.

APPENDIX A
TARIFF AND TRADE AGREEMENT TERMS

TARIFF AND TRADE AGREEMENT TERMS

In the ***Harmonized Tariff Schedule of the United States*** (HTS), chapters 1through 97 cover all goods in trade and incorporate in the tariff nomenclature the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description. Subordinate 8-digit product subdivisions, either enacted by Congress or proclaimed by the President, allow more narrowly applicable duty rates; 10-digit administrative statistical reporting numbers provide data of national interest. Chapters 98 and 99 contain special U.S. classifications and temporary rate provisions, respectively. The HTS replaced the *Tariff Schedules of the United States* (TSUS) effective January 1, 1989.

Duty rates in the ***general*** subcolumn of HTS column 1 are normal trade relations rates; many general rates have been eliminated or are being reduced due to concessions resulting from the Uruguay Round of Multilateral Trade Negotiations. Column 1-general duty rates apply to all countries except those listed in HTS general note 3(b) (Cuba, Laos, and North Korea) plus Serbia and Montenegro, which are subject to the statutory rates set forth in ***column 2***. Specified goods from designated general-rate countries may be eligible for reduced rates of duty or duty-free entry under preferential tariff programs, as set forth in the ***special*** subcolumn of HTS rate of duty column 1 or in the general notes. If eligibility for special tariff rates is not claimed or established, goods are dutiable at column 1-general rates. The HTS does not list countries covered by a total or partial embargo.

The ***Generalized System of Preferences*** (GSP) affords nonreciprocal tariff preferences to designated beneficiary developing countries. The U.S. GSP, enacted in title V of the Trade Act of 1974 for 10 years and extended several times thereafter, applies to merchandise imported on or after January 1, 1976, and before the close of December 31, 2006. Indicated by the symbol "A", "A*", or "A+" in the special subcolumn, GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing countries (see HTS gen. note 4). Eligible products of listed sub-Saharan African countries may qualify for duty-free entry under the ***African Growth and Opportunity Act*** (AGOA) (see HTS gen. note 16) through September 30, 2008, as indicated by the symbol “D” in the special subcolumn; see subchapter XIX of chapter 98.

The ***Caribbean Basin Economic Recovery Act*** (CBERA) affords nonreciprocal tariff preferences to designated Caribbean Basin developing countries. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to goods entered, or withdrawn from warehouse for consumption, on or after January 1, 1984. Indicated by the symbol "E" or "E*" in the special subcolumn, CBERA provides duty-free entry to eligible articles, and reduced-duty treatment to certain other articles, which are the product of and imported directly from designated countries (see HTS gen. note 7). Eligible products of listed beneficiary countries may qualify for duty-free or reduced-duty entry under the ***Caribbean Basin Trade Partnership Act*** (CBTPA) (see HTS gen. note 17), through September 30, 2008, as indicated by the symbol “R” in the special subcolumn; see subchapter XX of chapter 98.

Free rates of duty in the special subcolumn followed by the symbol "IL" are applicable to products of Israel under the ***United States-Israel Free Trade Area Implementation Act*** of 1985 (IFTA), as provided in general note 8 to the HTS; see also subchapter VIII of chapter 99.

Preferential nonreciprocal duty-free treatment in the special subcolumn followed by the symbol "J" or "J*" in parentheses is afforded to eligible articles from designated beneficiary countries under the ***Andean Trade Preference Act*** (ATPA), enacted as title II of Public Law 102-182 (effective July 22, 1992; see HTS gen. note 11) and renewed through December 31, 2006, by the ***Andean Trade Promotion and Drug Eradication Act*** of 2002.

Preferential free rates of duty in the special subcolumn followed by the symbol "CA" are applicable to eligible goods of Canada, and rates followed by the symbol "MX" are applicable to eligible goods of Mexico, under the ***North American Free Trade Agreement*** (NAFTA), as provided in general note 12 to the HTS and implemented effective January 1, 1994, by Presidential Proclamation 6641 of December 15, 1993. Goods must originate in the NAFTA region under rules set forth in general note 12(t) and meet other requirements of the note and applicable regulations.

Preferential rates of duty in the special subcolumn followed by the symbol “JO” are applicable to eligible goods of Jordan under the ***United States-Jordan Free Trade Area Implementation Act,*** (JFTA) effective as of Dec. 17, 2001; see HTS gen. note 18 and subchapter IX of chapter 99.

Other special tariff treatment applies to particular ***products of insular possessions*** (gen. note 3(a)(iv)), ***products of the West Bank and Gaza Strip*** (gen. note 3(a)(v)), goods covered by the ***Automotive Products Trade Act*** (APTA) (gen. note 5) and the ***Agreement on Trade in Civil Aircraft*** (ATCA) (gen. note 6), ***articles imported from freely associated states*** (gen. note 10), ***pharmaceutical products*** (gen. note 13), and ***intermediate chemicals for dyes*** (gen. note 14).

The ***General Agreement on Tariffs and Trade 1994*** (GATT 1994), pursuant to the Agreement Establishing the World Trade Organization, is based upon the earlier GATT 1947 (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) as the primary multilateral system of discipline and principles governing international trade. The agreements mandate most-favored-nation treatment, maintenance of scheduled concession rates of duty, and national treatment for imported goods; GATT provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, antidumping and countervailing duties, dispute settlement, and other measures. Results of the Uruguay Round of multilateral tariff negotiations are set forth in separate schedules of concessions for each participating contracting party, with the U.S. schedule designated as Schedule XX. Pursuant to the **Agreement on Textiles and Clothing** (ATC) of the GATT 1994, member countries are phasing out restrictions on imports under the prior "Arrangement Regarding International Trade in Textiles" (known as the **Multifiber Arrangement** (MFA)). Under the MFA, a departure from GATT 1947 provisions, importing and exporting countries negotiated bilateral agreements limiting textile and apparel shipments, and importing countries could take unilateral action to control shipments. Quantitative limits were established on textiles and apparel of cotton, other vegetable fibers, wool, man-made fibers or silk blends in an effort to prevent or limit market disruption in the importing countries. The ATC establishes notification and safeguard procedures, along with other rules concerning the customs treatment of textile and apparel shipments, and calls for the eventual complete integration of this sector into the GATT 1994 and the phase-out of quotas over a ten-year period, or by Jan. 1, 2005.